

# The Iron Age

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Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXVI: No. 1

New York, Thursday, July 2, 1885.

\$4.50 a Year, Including Postage.  
Single Copies, Ten Cents.

## Calculating Machines.

Calculating machines are of two kinds—the automatic and the semi-automatic. The former, though capable of producing astounding results, are exceedingly expensive, and have never had an extended application. The latter have been known in one form or another for many years, and are employed by actuaries, insurance companies, electricians and many others who have long and tedious arithmetical calculations to work out. They are all based upon the use of the "stepped reckoner" invented by the Earl of Stanhope between the years 1775 and 1780. This device is illustrated on this page, and, as it forms the foundation of all those machines, it is worth while to describe it at some length, as when its action is understood the details of any form of arithmometer may be comprehended at a glance. For the engravings and the following particulars we are indebted to *Engineering*. The essential part is a cylinder having formed upon it a segmental wheel of nine teeth. These teeth embrace together about one-third of the periphery of the cylinder, and no two of them of the same length. The variation proceeds by regular increments the lengths of the teeth in the specimen from which the engraving was prepared being, for the first, .15 inch; for the second, .3 inch; for the third, .45 inch; for the fourth, .6 inch; for the fifth, .75 inch, and so on. These teeth gear into a pinion on a second shaft parallel to the axis of the cylinder. This pinion has 10 teeth, and is about  $\frac{1}{8}$  inch wide. It is fixed on its shaft by a feather key, and is capable of being slid lengthwise of the cylinder, so that it may be placed opposite the longest or the shortest teeth, or in any position intermediate between the two. When it is opposite the free end of the longest tooth it is evident that the rotation of the cylinder or stepped reckoner will rotate the pinion through one tooth or one-tenth of a revolution, and when it is opposite the shortest tooth the pinion will gear successively with all the teeth and make nine-tenths of a revolution. Similarly, if it be placed at an intermediate position, eight-tenths, four-tenths, and so on, of a revolution can be imparted to it. Now, if the pinion shaft were provided with a finger moving over a dial figured 0 to 9, it is evident that at each revolution of the stepped reckoner the finger would move over a certain number of the figures, according to the position of the pinion. These two parts, the stepped reckoner and the pinion, constitute the essence of a calculating machine, the pinion being moved along its shaft by the operator to the required point, and then rotated by the reckoner, which turns once for each turn of the handle of the machine. Thus, if the pinion were placed opposite the sixth tooth, and the handle were turned three times, the pinion and its shaft would make one complete revolution and eight-tenths of a second, and the finger would come to rest over the figure 8 of the dial. But an arithmometer would be little relief to the operator if he needed to keep mental note of the complete revolutions of the index and could only read the units from the scale. Even with simple sums, such as the example above, this would be true, while when the figures ran into millions it would be impossible to carry the amounts in the mind. To avoid this there is employed a carrying device which, as soon as the result exceeds 10, carries 1 to the next column, just as is done in simple addition. This device is shown at the end of the stepped cylinder, and consists of a single tooth that can be slid along the shaft, so as to come into gear or not, as the case may be, with a second pinion on the pinion shaft. When the pinion shaft is just completing a revolution a cam in connection with the index draws the tooth on the next cylinder into gear, and then releases it to be moved back by a scroll cam to which it is attached.

So far the parts we have described are common to all machines of this class, but the engraving, which is taken from a machine invented by Mr. Jos. Edmundson, of Halifax, Yorks, shows some details which are peculiar to the machine in question. The pinion is attached to a long sleeve, at the other end of which is a star-wheel working against a long cylinder formed in one with the stepped reckoner. The cylinder acts as a ring-wheel, the solid portion being of such an extent that it will hold the star in all positions until the pinion gears with the teeth on the reckoner. At that point the ring is cut away and the star-wheel is released, to be again caught soon after the pinion comes out of gear—not immediately, because time must be given for the carrying device to rotate its pinion, and the shaft, if necessary. But in the interval the shaft is not free, because the carrying pinion has also a star-wheel which holds it at this point until the carrying finger actually gears with it. Upon the pinion shaft there is mounted a pair of bevel pinions which gear one at a time into a second pinion on a vertical spindle. This latter rotates to the right or left, according as one or other of the pinions is in gear with it.

Having thus described the elemental feature, it is an easy matter to explain the complete machine. Eight stepped reckoners are arranged radially around a central point. They are covered by a plate upon which are mounted "number slides"—that is, finger keys—which serve to slide the pinions along their shafts and to indicate their positions by numbers stamped on their faces. For

instance, the right-hand pinion of all is set to gear with eight teeth of the reckoner, the next with three, the next with five, and so on. All the stepped reckoners are geared by bevel pinions to a large bevel-wheel which is rotated by the driving handle. The pinion shafts are geared to little vertical spindles in the central disk, and these spindles carry each a disk numbered 0 to 9 on its upper extremity. One of the numbers can always be seen through a hole in the central plate. In the engraving this plate is removed to show the mechanism. There is also fixed on each central spindle a cam which at one part of its revolution catches a lever attached to the carrying device of the next reckoner and brings it into action. Now, supposing all the figures in the central disk to be ciphers, it will be seen that the effect of one rotation of the handle will be to cause an 8 to appear in the units hole, a 9 in the 10's hole, a 5 in the 100's hole, and so on. That is to say, the multiplicand on the number slides has been multiplied by 1, and the result written on the disk. A second turn of the handle will add 8 to the first hole, making it 16, of which the 6 will appear and the one will be carried to the

traction (—). The three are provided for convenience, as sometimes one part of the circle and sometimes another is disengaged. They are geared to the main bevel-wheel, and have three positions. In one they are quite out of action; in the second (—) they add 1 at each revolution, and in the third (—) they add 9 at each revolution, which is the equivalent of subtracting 1, and they have no carrying device. The result is that, in multiplying or dividing, the multiplier or the quotient is written on the disk as the sum proceeds. When the work is finished the disk is raised, and the eraser, a curved rack, is brought into gear with the pinions, and successively returns them to zero as they are carried past it.

The chief feature of novelty in the apparatus is its circular form. The advantage of this scarcely needs to be pointed out, as it is evident that it allows the work to proceed without the figures running off the end of the scale. Suppose four or five numbers, each having four decimal places, are to be multiplied together; it is evident that very soon they will extend to a great length, of which the portion past the decimal point will have very little value. By erasing the

their full height. That, however, is only the non-professional view. In practice the engineers prefer to put together the steel bridge (for every part of the metal work is of steel) at low elevation, and then to raise the completed structure foot by foot by hydraulic power, building up at the same time foot by foot the granite masonry of the piers on which it rests.

Undoubtedly the most difficult and most anxious part of the undertaking is the founding and building up in deep water of the piers which form the base of the cantilevers. The cantilever principle has been adopted by Mr. Fowler, the designer and engineer of the bridge, as the best means of spanning the two wide channels of deep water north and south of the Island of Inchgarvie, each forming a span of 1700 feet. According to Mr. Fowler's design, each of the three cantilevers rests on a group of four piers, the central one being on the Island of Inchgarvie, or, to be quite accurate, partly on the island and partly on the shelving rock to the south of it. We have thus to account for 12 piers, forming the basis of three cantilevers. It is satisfactory to note that with this delicate and trying part of the work

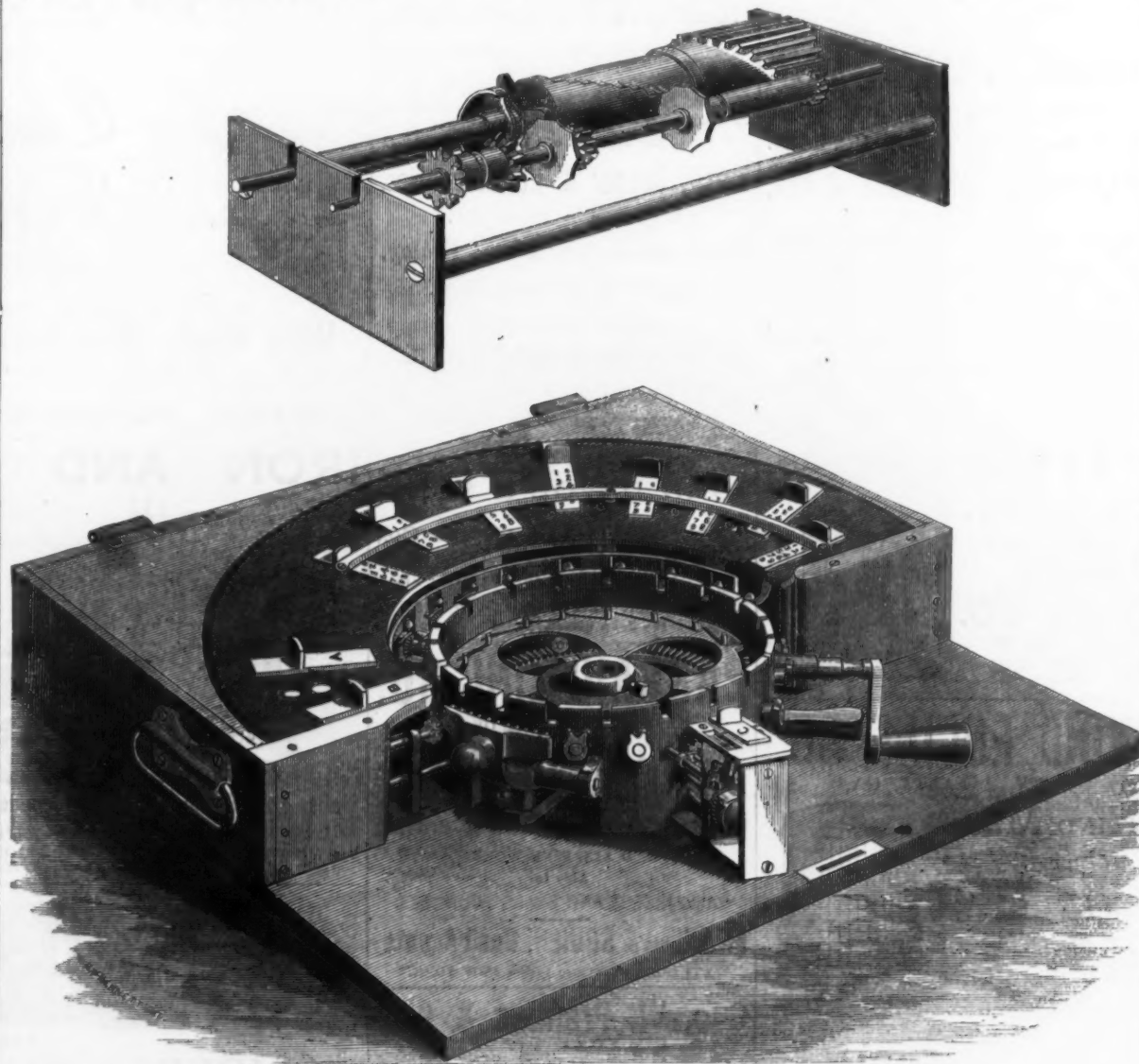
men descend and ascend, while by the others the soil which they dig out is carried away. When the caisson has been sunk to the requisite depth the air chamber is completely filled with concrete and is sealed. On this concrete bed the floor of the caisson rests, and then, the shafts having been removed, the work of building the pier, with granite blocks on the outside and freestone and concrete in the interior, is carried on within the caisson under the open sky, in the same way as within an ordinary cofferdam. The work of excavating the subsoil within the compressed air chamber is carried on chiefly by Italians, who have had experience in that kind of labor in connection with other similar works.

Such being the method of working, it remains to take note of the progress that has been made in this part of the operations. To begin with the southern group of four piers, Pier No. 1 is completed, and is ready to receive the plate-bed of the cantilever. Pier No. 2 is far advanced. Nothing is now seen of the caissons of these piers, the upper parts of them having been removed. Some idea of the mass of masonry in these granite piers may be gathered from the fact that they are, as has been said, 70 feet in diameter, and that the base of their foundation is 73 feet below high water. The caisson for Pier No. 3, however, has suffered shipwreck. After it had been floated out and safely lowered into its position it unaccountably canted over, suffered damage in the accident, and is now half filled with water. Its recovery will be a work of some difficulty, and will involve the contractors in great expense, though there need be no doubt of the ultimate success of the operation. For Pier No. 4 the caisson is in position, and has been sunk to its final level, the air chamber (the bottom of which is 90 feet below high water) having been filled up and sealed some weeks ago.

The second group of four piers is at the Island of Inchgarvie, in mid-stream, partly on the island and partly on the shelving rock to the south of it. Two of these piers (Nos. 7 and 8) are completed, and for the other two the foundations are being prepared. This is a work of no small difficulty, owing to the abrupt slope of the sea bottom. The caisson must rest on a fairly level bed, and this is being artificially obtained by lowering into the sea many thousands of bags of sand. The caisson of Pier No. 6 is ready, and is now moored at the end of the temporary staging on the south side, awaiting the preparation of its bed. The fourth caisson of this group (No. 5), and the last of the whole, is now being constructed close to the Queensferry shore. The third and last group of four piers is that on the northern or Fife shore. Three of these are completed and have received their lower plate-beds, on which the cantilever will rest. The fourth pier (No. 10), which is protected toward the sea by a coffer-dam, is far advanced toward completion. It thus appears that of the 12 piers which are to form the foundation of the three cantilevers six are finished, two are far advanced, and three are making good progress, while only one is in a position to cause anxiety or delay. This, it must be admitted, is very good work, and it may now be fairly said that the back of the great enterprise has been broken.

Nothing strikes one more in going over the works than the vast extent, the solidity and the variety of the merely temporary work—the scaffolding, so to speak—which is required in order to rear the permanent structure. At the Island of Inchgarvie, for example, the whole area bounded by the four piers—an area measuring 270 feet by 120 feet—is occupied with a temporary staging of wood and iron, which has all the appearance of a permanent wharf. On the south side the main staging is carried out from the shore to the first group of piers, a distance of 2000 feet, and it carries lines of railway, large workshops and numerous cranes and engines. One gets the best idea, however, of the extent of the temporary works by going over the workshops and drilling roads on the top of the hill above South Queensferry. These works have been much extended. Several new workshops have been added, including a vast molding shop, with blackboard floor, on which the several parts of the structure are laid down in life size. The most interesting part of the work is seen on the drilling roads, where the cantilevers are being put together and built up precisely as they will be on top of the piers. After being fitted together here, they will be taken to pieces again and transported piecemeal to their places in the bridge, with a view to which each plate, truss and diaphragm is carefully marked and numbered. In examining these structures one gets a vivid idea, though still a very partial one, of the vast dimensions which the completed structure will assume. The shortest of the steel cylinders, 12 feet in diameter, which will stretch from pier to pier, are 145 feet in length, while the two longest—those on the Inchgarvie piers—measure 260 feet. At the extremities of these huge cylinders, where the arms are thrown upward and outward, so as to form the spring of the arches of the bridge—which are not, in fact, true arches—and where, consequently, the strain will be greatest, the tubes are strengthened by the insertion into their interior of a complicated system of diaphragms and trusses, which is apt to baffle the non-professional eye. The drilling engines are marvels of ingenuity and exactness. They completely surround the cylinders, so that the operation

(Continued on page 5.)



EDMUNDSON'S CALCULATING MACHINE.

next hole, making it, with the 3 from above, into 7, and so on. But if the multiplier be a large number, say 1111, it is evident that it would be a wearisome work to turn the handle over a thousand times to work a simple multiplication sum. Nor is it requisite. When the unit place has been worked off, the central disk is lifted bodily, to bring all its wheels out of gear with the pinion shafts, and is rotated to the left one hole, the effect being exactly the same as setting the second line of a multiplication sum one place to the left. When the next multiplier is worked off the disk is again displaced one hole, and so on.

The process of division is exactly the same except that the regulator handle is put over in such a way as to bring the other set of bevel pinions in gear with the vertical shaft and move the disks backward. In this case the dividend is placed on the circle and the divisor on the number slides at the left of the series, with its highest digit opposite the highest digit of the divisor. The figures on the circles are turned by raising the disk and rotating the ends of the spindles, which protrude above its surface. The division is then accomplished by a process that recalls the ordinary method of working long-division sums. It is not, however, our object to write a handbook to the use of the instrument, but to describe its mechanism. There are yet three "index slides" that we have not mentioned. They are all designed to count the turns of the handles, adding or subtracting them to or from the number in the hole before them, according as the index on the slide is set to addition (+) or to sub-

redundant decimals and turning the disk back the entire operation can be conducted at once, whereas if the scale were straight the numbers would have to be copied on paper and then transferred back to the scale.

## The Progress of the Forth Bridge.

Favored by a mild winter and an almost total absence of gales, rapid progress has been made on the construction of the great Forth Bridge. At both the shoreward ends the approach piers have been completed, with one exception, on the south side up to the level at which they receive the girders. That, however, gives no idea of the height to which they will ultimately be carried. They are now only 13 feet 6 inches above high water, and the solid masonry is still to be carried up 125 feet higher. But already the work of placing the girders in position has been begun, and the superstructure of the bridge begins to show. On the Queensferry side the girders have been completed over three spans, and with the fourth and fifth spans some progress has been made. On the Fife side this part of the work is still further advanced, the girders on which the permanent way will rest having been laid down over nearly the whole of the approach piers. This is a feature of the work which puzzles the unskilled observer. One would naturally expect that no attempt would be made to place the girders which are to carry the railroad until the piers on which they are to rest have been built up to

remarkable progress has been made. In order to estimate truly the nature of the operation, we must try and realize what it involves. Each pier is built up within a circular water-tight iron caisson, from 90 feet to 120 feet in height, according to the depth of water, and 70 feet in diameter, which is floated out to its position and sunk in the bed of the estuary. The pier, however, cannot rest on the surface of the sea bottom. Its foundations must be sunk and rooted in the subsoil, precisely as in the case of a pier or of any other building on dry land. To effect this the caisson must first be sunk to the required depth, the maximum being 45 feet, and the foundation must then be built inside of it.

This is undoubtedly the most difficult and hazardous part of the operation, as it has to be carried on not only in deep water, but also over an extended area. It is accomplished in the following way: The floor of the caisson is 7 feet above its lower rim. There is thus formed in its lower part a chamber 70 feet in diameter and 7 feet high. This chamber is air-tight, and is, in fact, a huge diving-bell, within which the workmen carry on the work of excavation; and as they excavate the caisson sinks foot by foot into the bed of the channel. The chamber is kept constantly filled with compressed air, which serves at once to exclude the water and to enable the men to breathe freely, and it is amply lighted with electric lights. The only means of communicating with the chamber is by three air-tight iron shafts or hollow columns rising from the floor of the caisson to the top of it, by one of which the



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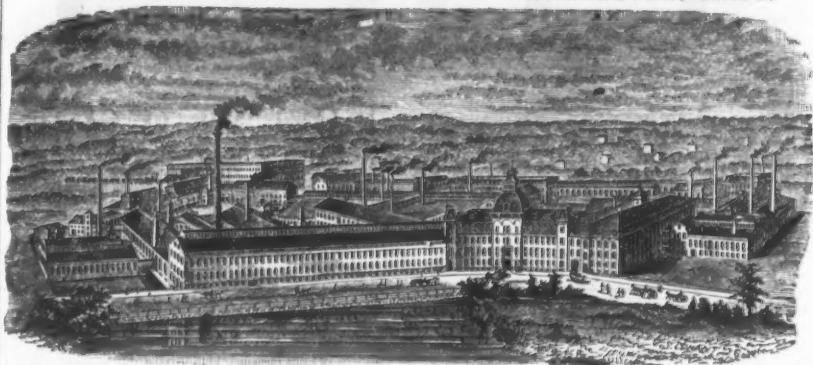
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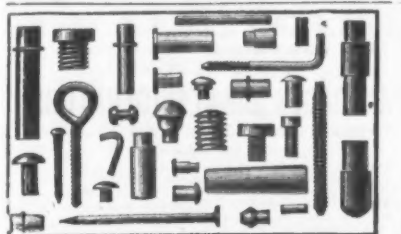


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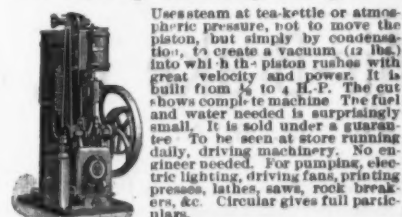


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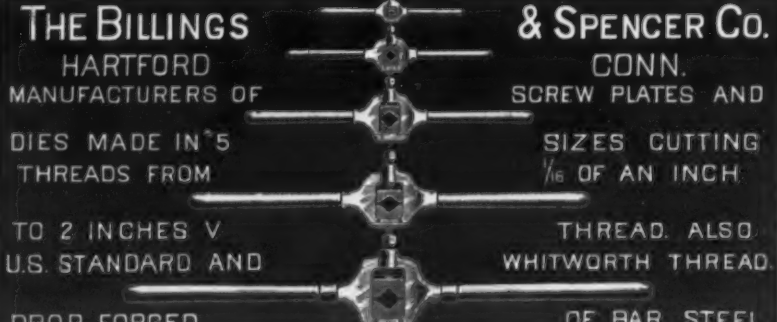
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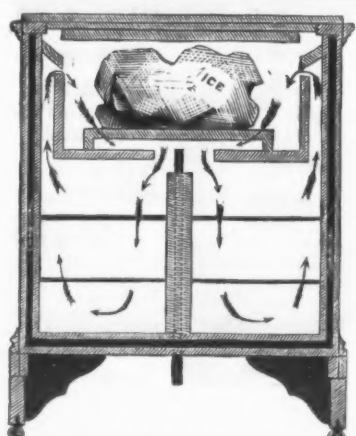
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(Concluded from page 1.)  
of drilling is carried on at many points at  
the same time.  
It may be useful to repeat here some par-  
ticulars regarding the statistics of the great  
undertaking. The total length of the bridge  
is 8091 feet, or upward of a mile and a half.  
The length of the main portion from cantilever  
pier to cantilever pier is 5342 feet. The  
two main spans, north and south of Inchgar-  
vie, are 1710 feet each. The two main half-  
spans are 680 feet each. In the approach  
viaducts there are 15 spans—10 on the south  
side and five on the north—of which 13 are  
spans of 168 feet each, the other two, next  
to the cantilever piers, being of 179 feet.  
The height of the rails above high water will  
be 150 feet. The breadth of each cantilever  
at base is 120 feet, at the top 35 feet, and at  
the extremities 35 feet. The height of the  
cantilever columns is 350 feet. The number  
of men employed on the works is about 2000.  
The estimated cost of the whole undertaking  
is \$8,000,000. The work has now been in  
progress for two years and a half. It is ex-  
pected to occupy another five years at least.

**Fire Risks in the Agricultural Imple-  
ment Industry.\***

In 1880 the number of agricultural-implement manufacturing in the United States, by the census, was 1943; capital employed, \$62,109,668; whole number of hands (chiefly adults), 39,580; and annual production, \$68,640,486. If all the agricultural machines and implements which in the census have been put under other classifications were added to the last sum it would probably exceed \$80,000,000. It has mainly been within the past 30 years that the vast number of agricultural machines and tools now used have been invented, steam and horse power applied to them, and such improvements made as have more than quadrupled the power to produce cereals, vegetables, cotton, tobacco and hemp, and till with ease great tracts of land formerly deemed impossible of culture. Agricultural implements and tools now number nearly 500 kinds, made in various divisions, all included under one general head. We find in the tenth census that 77 per cent. of the agricultural-implement works were distributed—without tendency to centralization—among these 12 States:

States.	Estab- lish- ment.	Capital.	Whole number of employees.	Value of production in 1880.
Ohio.....	156	\$16,111,576	7,596	\$15,479,825
Illinois.....	280	11,308,355	7,300	13,498,575
New York.....	265	9,590,000	8,463	10,707,761
Wisconsin.....	106	3,747,065	2,067	3,742,069
Pennsylvania.....	220	3,482,925	2,617	3,686,212
Indiana.....	96	3,231,818	2,471	4,400,408
Michigan.....	143	2,488,287	2,004	3,102,638
Minnesota.....	32	2,315,222	1,107	2,340,288
Kentucky.....	66	2,206,037	1,023	1,647,116
Iowa.....	58	1,185,530	809	1,371,872
Massachusetts.....	29	910,000	973	1,070,242
Missouri.....	74	645,772	726	1,141,822
In 12 States.....	1,497	\$57,271,224	35,185	\$62,748,833
In all other States and Territories.....	456	4,898,444	4,395	5,891,653
Total.....	1,943	\$62,109,668	39,580	\$68,640,486

The Chronicle Fire Tables give 196 as the number of agricultural-implement works taking fire during the nine years 1875-83, which would be 1.12 per cent. ignitions if 1943 were the average annual number of the establishments during such period, and such representing about .5 per cent. of combustion. The Massachusetts State records show no fires occurring among 29 or more agricultural-implement works of that State in the years 1882, 1883 and 1884, and only two partial fires in the quinquennium 1876, 1878, 1879, 1880 and 1881, with losses of \$8950, and insurance paid \$5210. It will be useful to examine the probable causes of this immunity from burning, and whether it is likely to be a permanent condition. To consider properly the fire hazards of agricultural-implement works, they should be divided into four general classes; and exactness would require their subdivision, and the specification of those combining the work of two or more divisions. It will thus be seen that this is a rather intricate inquiry, and cannot be carried as far as desirable. The principal classes of agricultural machines and tools are:

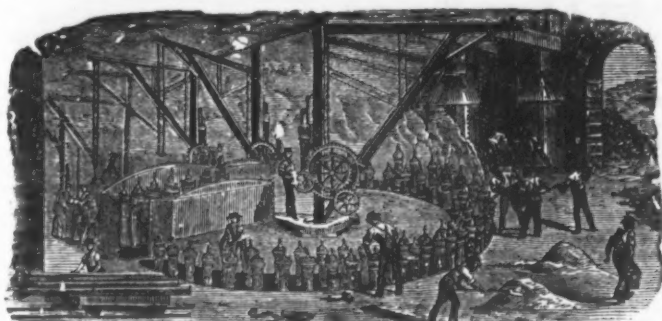
1. Portable steam engines, farm boilers and evaporators, stationary horse-power, cane crushing mills, feed steaming arrangements, pumps, presses (all iron), cotton gins, conical grain grinders, snut machines, corn huskers, shellers and crushers, hay and straw cutters, ensilage cutters, lawn mowers, fruit and root cutters, continuous beet presses, &c., being work allied mainly to the foundry and machine shop.
2. Grain reaping, binding and threshing machines, grain registers, horse-power mowers, movable horse-power tread-mills, drills, planters, rakes, sowers for grain, seed and fertilizers (all six descriptions for horse-power), "sulky" and other wheel plows, hay loaders and tedders, harrows, land rollers, wheelbarrows, wheel watering carts, &c., all resembling the work of the wheelwright and cart-maker.
3. Fanning mills, separators, large pea shellers, windmills, cider and wine presses, hay and baling presses (largely of wood), grain cradles, churns, hives, butter tubs and workers, incubators, cheese presses and dairy fixtures, root pullers, sausage stuffers, stalk and stump pullers, fruit driers, sheep washing and shearing machines—work resembling that of the carpenter shop or general wood-working establishment.
4. Various hand implements and smaller tools, such as scythes, sickles, rakes, forks, spades, shovels, axes, plows and cultivators without wheels, potato, root and post diggers, hay elevators, bag fillers and weighers.

\* American Exchange and Review.  
† It is evident that the annual production in the table above given cannot fully represent this division, because in the census many of these machines, such as portable steam engines and presses, are included in foundry and machine-shop products.  
‡ A large field will probably soon open for this division and No. 2 in the making of numerous machines of peculiar construction now used in Europe for cultivating sugar beets.  
§ Of these implements and tools a large portion is, in the census, placed under the two classifications "hardware and cutlery and edge tools"; so that this division has not full representation of annual production, &c., in the table given.



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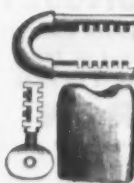
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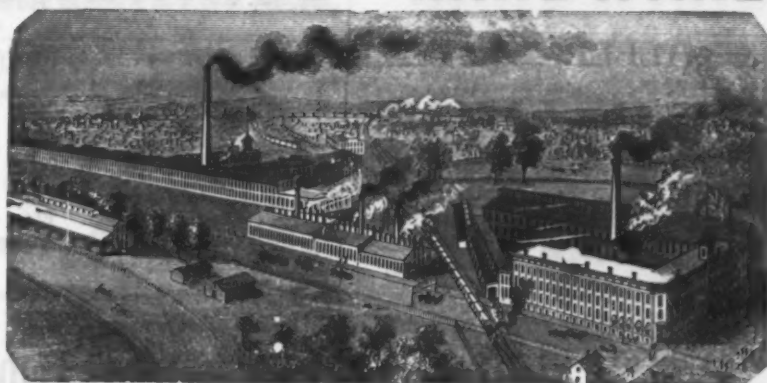
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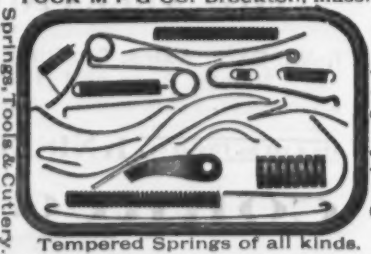
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Latest, Cheapest  
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**ECONOMY  
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Send for Catalogue.  
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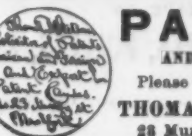
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Pamphlets showing sizes of grain sent free.

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THREE DIFFERENT  
SIZES, SPOUTS  
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NO SOLDER  
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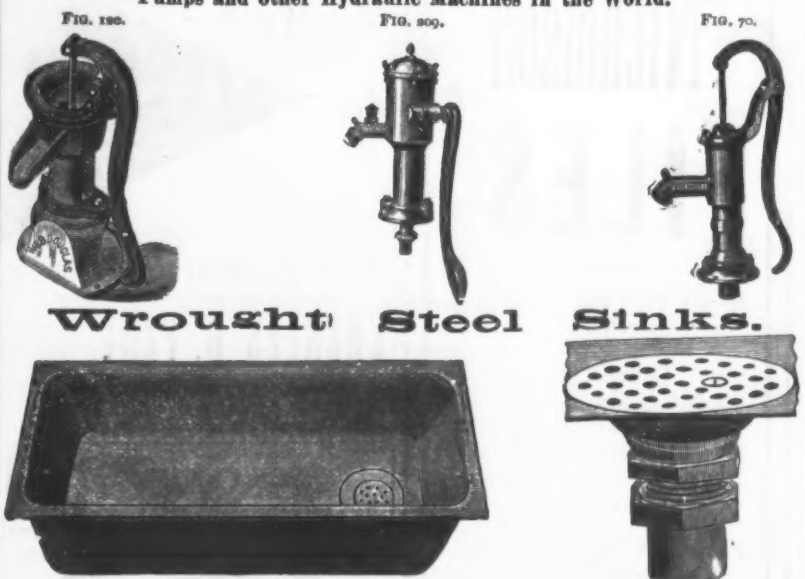
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**PUMPS, HYDRAULIC RAMS, GARDEN ENGINES.**Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill  
Pumps and other Hydraulic Machines in the World.**Wrought Steel Sinks.**

One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.

The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.


**BRANCH WAREHOUSES:**

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**FIG. 114.**

Manufacturers of  
**SKINNER'S PATENT  
COMBINATION CHUCK.**  
Plain and Ornamental Butts,  
Single and Double Acting Spring Hinges,  
Union Coil Door Springs,  
Galvanized Pump Chain,  
Patent Rubber Buckets,  
Wooden Well Curbs, Wood Tubing,  
Iron and Brass Pumps,  
Patent Copper Pumps,  
Hydraulic Rams, Power Pumps,  
&c., &c., &c.



**FIG. 114 REPRESENTS OUR  
Hand Force Pump.**  
It is made of brass, is strong and light, and is the best pump of its kind in the  
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BEARING DOOR MANGERS**  
For House Doors, Car Doors, Elevator Doors.  
Frictionless. Indestructible. Perfect. Send for Circular.  
**CONHOES IRON FOUNDRY & MACHINE CO., CONHOES, N. Y.**



broom-corn scrapers, transplanters, fruit  
parers and gatherers, &c.—work similar to  
that of general cutlery and tools, and  
analogous to the hardware factory fire risks.  
Of the first division there are establish-  
ments making portable steam engines alone  
or in connection with heavy traction engines,  
gang plows, earth anchors and land and  
road rollers. There are others devoted to  
cane-crushing mills, boilers and farm syrup-  
pans, certain kinds of iron presses, pumps,  
&c. In each of these subdivisions, the ma-  
terial being chiefly iron and the work largely  
performed in the foundry and on planing  
and drilling machines and lathes, their fire  
risk may be denominated exactly that of the  
foundry and machine shop. Usually the sub-  
divisions named are not so large as many  
machine works, and thus escape a portion of  
the danger appertaining to such industry.  
Other subdivisions make conical grain-grin-  
ders—sometimes these alone—along with corn  
huskers, shellers and crushers. Hay, straw  
and root cutters are also often made in their  
special works, wherein, as also in that just  
previously mentioned, the machine-shop fire  
risk predominates, being increased when-  
ever the foundry is near enough to be dan-  
gerous, but not influenced or increased by a  
foundry risk when the cast material is pur-  
chased from other parties, which is a very  
common practice with many such works.  
This is a consideration which should be kept  
in view in judging of any of the fire risks  
now under review.

Some very large establishments make  
plows alone, of which there are numerous  
varieties, many having too moderately high  
wheels (whence the name "sulky plow"),  
but the majority are plain, with one or two  
shares—others having, besides the two carry-  
ing-wheels, guide-wheels and from one to  
three colters in front of shares. Some plows  
for subsoiling and for breaking virgin earth  
have two large shares and are of great  
weight and strength. It is plain that the  
casting of the shares and tipping them with  
steel when not all composed of the latter  
forms a large part of the work, and that the  
foundry is here, if not predominant, largely  
influential in the fire hazard, and in such  
cases would be added a wheelwright and  
painter's fire risk incident to the making  
and finishing of the wheels, axles and hard-  
wood main shaft of the plow, and also the  
handles when the plow is of plain make.  
Cotton gins of several descriptions are made  
almost entirely by works devoted to textile  
machinery, and are therefore subjected to a  
risk higher than that of the machine shop, in  
that there is in such places added some extra  
carpenter and cabinet-maker fire risks,  
through the work done for other machinery  
made on the same premises.

The machines of the second division are  
those most generally known as the chief  
agricultural implements of the present day,  
and may be said to make the character of  
the industry. Most of them are mounted on  
two or four wheels, and they range from the  
simplest water-cask, wheelbarrow and land-  
roller to the very complicated mowing, reap-  
ing and binding machines. In all of them  
hardwoods predominate, and therefore  
among such work and stock flames would  
probably not rage so rapidly at the first as  
in shops using and encumbered with stocks  
of soft woods and their more combustible  
debris. Some of the establishments are very  
extensive, and find it necessary to have, if  
not on the lot, at least in the near neighbor-  
hood, a large drying-house for lumber. This  
is undoubtedly a menace wherever it exists,  
modified, of course, by distance and the  
construction and roofs of buildings. If the  
latter be of stone or brick, and roofs of  
slate or metal, the danger is much dimin-  
ished. Unfortunately, the buildings are  
often of wood, or they are sheds with board  
roofs, under which is much lumber, inviting  
the lodgment of sparks and the further in-  
crease of fire.

One considerable addition to the fire risk  
of works of this class is the large amount of  
blacksmithing needful for axles, stays and  
bolts, also for making steel thresher and  
cultivator and harrow teeth, &c. This is a  
greater danger than the ordinary blacksmith  
shop, because some of the fires must be quite  
large and there are often many forges. If  
the axles and bolts be made by other parties  
a due allowance should be made for it, but  
there still remain much blacksmith  
work that is unavoidable. The numerous  
steel springs used are but rarely made on  
the premises; this relieves from the danger  
of tempering ovens used for them, supposing  
the same forge fires were employed as for  
other work, but tempering ovens may still  
be needed for large knife blades and sheaths.

In medium and large establishments of  
this class there are used medium and small  
circular and band and jig saws, eccentric  
turning lathes for spokes, centering and  
turning lathes for axles, planers, shapers  
and molders, besides common lathes. In  
fact, where in an ordinary wheelwright  
works handwork would be used, here ma-  
chinery is adopted, and there is the in-  
evitable glue pot, with its heating arrange-  
ment, and the usual paint and varnish risk  
inseparable from vehicle work; also danger  
through the use and storage of such ma-  
terials. Tar and other grease for axles, &c.,  
are to be found in various places about the  
shops, standing in pots and pans, and in  
bulk these add to the danger of a stock  
which, without them, must be considered  
as of very combustible nature. The  
shavings and debris here made are large  
in quantity—being generally burned un-  
der boilers—involving a special fire risk  
which we have previously discussed and  
now will only remark is dependent en-  
tirely on the excellence of flues and the  
safe working of well-arranged fans, cut-offs  
and stops. The centrifugal fans needed for  
this, and the large elevators to be found in  
some of these works, have their own special  
dangers.

When the large steel knives and their cov-  
ering sheaths for reapers, and also colters,  
are made on the premises there is added a  
distinct cutler's fire risk, with the danger  
from the open fires and tempering ovens re-  
quired for such purpose. Large quantities  
of rubber hose are now used for conducting  
grain and seed from hoppers to delivery  
holes of planters; and although this material  
is made by other parties, its presence in  
stock would be found to add largely to the  
rapid burning thereof. It is worthy of

notice, and is a large diminution of the fire  
risk in certain cases, that some agricultural  
implement works have all their wheels  
made by other parties, and few of them in  
any instance make their own bolts; many  
do not even make their reaper knives and  
barrow teeth. The assembling of the parts,  
however, and other work, cause a large  
wheelwright, or rather a modified plan-  
ing mill, fire risk, and the paint and  
varnish risks and of materials for these  
in stock are in addition. The risks which  
we have here stated for this department,  
even with the drawbacks named, are so evi-  
dent to any one that we confess it is rather  
puzzling to understand the apparent low rate  
of burning which seems usually to attend  
this industry.

For the agricultural machines and imple-  
ments of Division No. 3 much soft lumber is  
employed, and the number and kind of  
wood-working machines being similar to  
those of No. 2, the fire risk is much the same,  
but increased in so far as softer woods are  
used, and the danger from debris is greater in  
the shops and in the usual disposal of shav-  
ings and turnings by the automatic feeding  
thereof to boiler furnaces. The paint and  
varnish risks in process and stock are much  
the same as in No. 2, except that the danger  
to stock is greater from the large storage,  
and, it may be, the curing and drying of  
several descriptions of softer material.

There is also an additional danger from  
there being in all parts of the works, as well  
as in stock, many more small parts of soft  
wood to cause the rapid spreading of flames  
should ignition occur. There is not so much  
heavy blacksmith work in this division as in  
No. 2, thus considerably decreasing here one  
portion of the fire risk; and generally the  
bolts, and sometimes all the castings, are  
furnished by other parties. The absence of  
a foundry should count largely in favor of  
any establishment in this industry; in truth,  
throughout it, to obtain a fair idea of the  
fire risk of any special portion or division,  
there must be much balancing of risky work  
and processes omitted, against dangerous  
machinery and processes retained.

The agricultural implements of Division  
No. 4 require much less wood-working ma-  
chinery than Nos. 2 and 3, and frequently  
the works have no automatic shaving burn-  
ers, but relatively they have greater foundry  
and forge risks. There is not much use  
here of knives, knife-sheaths or teeth, and  
what are needed, as also the bolts, are  
usually made elsewhere. Some of the works,  
such as those in New England, making  
shovels, spades and axes, are of great size,  
and thereby have augment of hazard. We  
would rate this division as a combined  
foundry and blacksmith risk, the latter pre-  
dominating, and both somewhat increased  
by the making of the numerous wooden  
handles used and other woodwork required,  
necessitating the use of planers, mortising  
machines and lathes, but to a much less ex-  
tent than in Divisions 2 and 3. The fire risk  
of this division resembles rather that of No.  
1 than the other two.

In all of them steam-power must generally  
enter into the calculation of the fire risk;  
and the size of establishment, and the loca-  
tion of foundry and lumber-curing rooms,  
in relation to main buildings, are of great  
importance. There is an influence working  
in the vast wheat and corn-regions of the  
Western, Northwestern and Southwestern  
States which may soon determine a larger  
proportion of the agricultural-implement  
risk to the first division of this inquiry. We  
refer to steam plowing, by the use of gangs  
of plows having single or double shares,  
drawn across a great field by wire ropes  
wound upon drums worked by a portable  
engine on each side of the field; harrows  
and cultivators are used in similar manner.  
The engines are kept in position by heavy  
disk anchors, mounted on a strong low  
truck. This plan, which for some years has  
been practiced in England, is now coming  
into use on our broad prairie lands and the  
great ranches and haciendas of the South-  
west. An improvement in extensive land  
cultivation has just been introduced in  
Europe by using dynamo-electric machines,  
mounted on the anchor truck (and connected  
by wire with a stationary steam or water  
power dynamo) for drawing the plow and  
harrow ropes.

The combined risks as here viewed seem  
to range themselves as No. 1 the least, next  
No. 4, and Nos. 2 and 3 so nearly balanced  
as to make decision rather difficult, but in-  
clining in favor of No. 2. The proper  
classification of these fire risks, as already  
intimated, is by no means easy or satisfac-  
tory, and it would be almost impossible to  
state what would be about the fire risk of a  
general agricultural-implement works, to in-  
clude all except perhaps the heavier machines  
of Division No. 1. There is no proper basis  
for comparison, so involved is their combina-  
tion. It is probable that in the near future  
these various kinds of establishments will  
become more comprehensive or their classi-  
fication better defined, so that their risks may  
be studied with more precision. In the  
meantime we give this analysis as an ap-  
proach toward such study.

**The Fastest English Cruiser.**—The  
fastest cruiser in the British squadron to be  
concentrated under the command of Admi-  
ral Horby is the Mercury, and it is asserted  
that she is the fastest full-sized ship afloat.  
The vessel has attained an average speed of  
over 18½ knots, or 21.275 miles, an hour,  
and thus surpasses by half a knot the Chilean  
cruiser Esmeralda (18 knots) and the  
French cruiser Milan (also 18 knots, launched  
in 1884), as well as the Phaeton and the Iris,  
the latter her sister ship, but launched a year  
before her (in 1877). As the Mercury is 300  
feet long and 46 feet beam, with a draft  
of water of 22 feet, this is an exceedingly  
high speed for so large a vessel. She and the  
Iris thus stand unrivaled as regards speed  
by any vessel of their size, the Esmeralda  
being only 277 feet in length, while the  
French vessel has a length of 303 feet, but a  
beam of only 33 feet. An authority on these  
matters says of the English cruisers that  
they are the first of a new type designed for  
high speed as the pre-eminent requisite. All  
other requirements have been subordinated  
to this important element. They present a  
beautifully sharp bow, and long, exceptionally  
clean run, and are altogether admirable  
specimens of a design for a swift and lightly-



Paris, 1878.

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This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.  
The blade is best cast steel, spring temper, easily sharpened, and giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.  
They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

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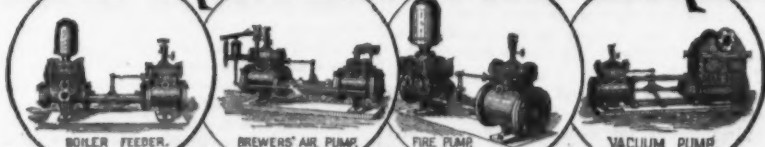
We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay Knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

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Flat,  
Flat Equaling,  
Flat Wood,  
Gang Edger,  
Ginsaw,  
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Half-Round,  
Half-Round Wood,  
Hand,  
Hand Equaling,  
Handsaw Blunt,  
Handsaw (Double-End),  
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Handsaw Taper, double-cut,  
Handsaw Taper, slim,  
High Back,  
Hook-Tooth,  
Knife,  
Knife Blunt,  
Lead Float,  
Lightning,  
Machine Mill,  
Mill,  
Mill Blunt,  
Mill Pointing,  
Pillar,  
Pitsaw,  
Reaper,  
Roller,  
Round,  
Round Blunt,  
Slotting,  
Slim Handsaw Taper,  
Square,  
Square Blunt,  
Square Equaling Files,  
Stave Saw,  
Three-Square Files,  
Three-Square Blunt Files,  
Tumbler Files,  
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Bread,  
Cabinet,  
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**SPECIALTIES.**

Butchers' Steels, Improved,  
Bent Rifflers, Handled,  
File Cards,  
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**NICHOLSON FILE CO.,**

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SOLE MANUFACTURERS.

**BLACK DIAMOND FILE WORKS.**

TRADE

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G. &amp; H. BARNETT, 21 to 43 Richmond St., PHILADELPHIA.

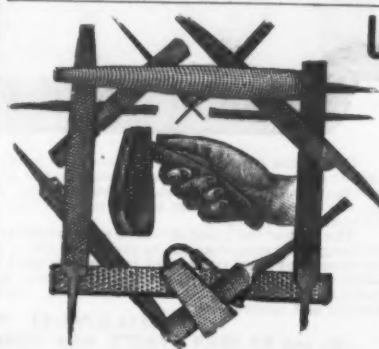
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Warranted Cast Steel.

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All descriptions of Files made to order. Price List mailed on application.

Established 1863.

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Made from the Best Refined Cast Steel.

In offering our goods we guarantee to give satisfaction, each file being thoroughly examined at every stage of manufacture and tested by an expert before leaving the works.  
We are continually increasing our facilities and are prepared to fill orders promptly.

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Specially Adapted for Use on Wire Fence.

Also Manufacturers of BLACKSMITHS' and MACHINISTS' STOCKS and DIES, PLUG and TAPER TAPS, HAND, NUT and SCREW TAPS, PIPE TAPS and REAMERS.

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For Coaches, Phaetons, Buggies, Wagons, &amp;c

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Special Machinery for Grain Elevators, Grain Steam Shovels, &c., contracted for. Car Wheels and Car Castings at lowest rates.

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**Expanding Mandrel**  
IS THE MOST PERFECT NOVELTY OUT.  
Simple, Inexpensive, Accurate.

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**GENERAL MACHINERY AND SUPPLIES**  
FOR  
Manufacturers, Mills, Mines, Railroads  
and Steamships.  
Engines, Boilers, Pumps, Blowers, &c.  
Write for circular and mention this paper.

**THE**  
**"FLORENCE"**  
**LAMP STOVE.**  
The People Want It. Why Don't You Sell It?



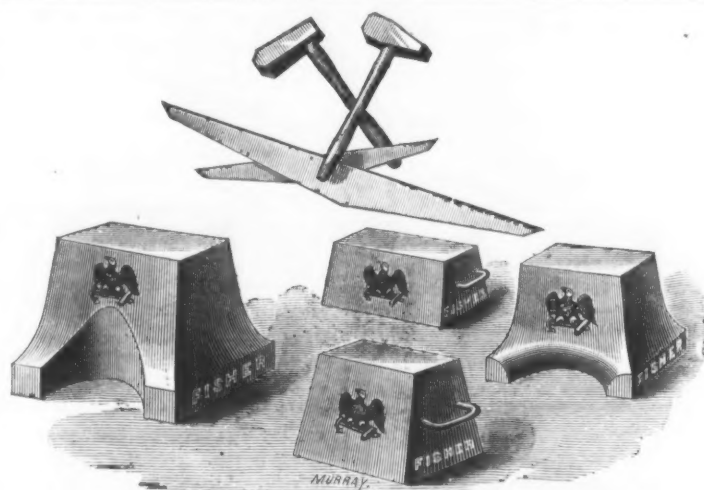
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Trowels, Shovels and Hoes.  
Has on hand some variety  
of Planters' Hoes, oval eyed  
and handled, Hilling Hoes,  
Oxton and Field Hoes, Shovels  
and Trowels, also Trade's and  
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Scales, Grain Scales, Platform  
Scales, Counter Scales, &c.**  
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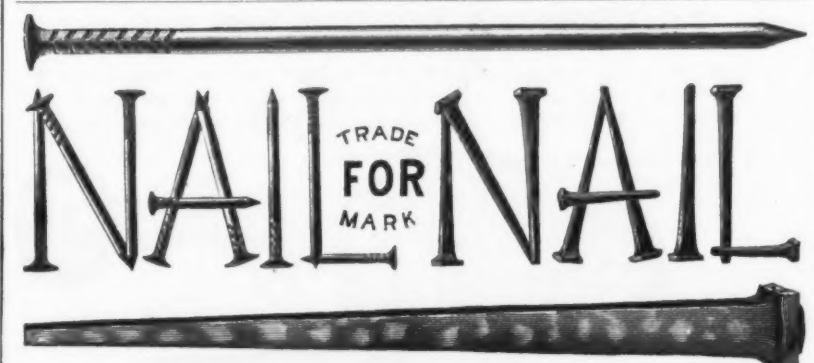


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(Established, 1849.)  
MAKE 50 SIZES OF  
**SAW-MAKERS' AND AXE-MAKERS' ANVILS,**  
For Smithing or Blocking, Warranted Better than any Other Make.

Superior, because face is in ONE PIECE OF JESSOP'S BEST CAST STEEL, of uniform, hardest  
temper, perfectly welded, and warranted never to settle or change from a true surface.  
"Cross-Pene" and "Dog-Head" Hammers, of Solid Cast Steel,  
of every desired Weight and Shape.

Also, STEEL STRAIGHT-EDGES FOR SAW-MAKERS' USE.




Wire Nails not of every quality. We only make  
the best, but of every description. Our specialty  
is Steel Wire Nails to replace Common Cut.  
Samples of these, with prices, mailed.  
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Steel, Wire and Wire Nail Manufacturers.

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Made in sections three feet long to fit every size of  
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applied by unskilled labor.  
**The Celebrated Patent Air Space Covering**  
for Steam Boilers and  
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IMPROVED  
**CARPENTERS' TOOLS.**  
No 45. Adjustable Beading, Rabbit  
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Dealers in Steel, Copper, Brass, Tin Plated and Copper Plated Wire,  
Manufacturers of **BESSEMER STEEL WASHERS.**

**PATENT SPOOL WIRE FOR THE RETAIL HARDWARE TRADE.**

Dealers who handle it do away with the **Broken Bundle Business** and sell small quanti-  
ties by the spool only. It is a convenience for both dealer and consumer. It is **Shellac-Coated**  
and **cannot rust**; is wound  
like spool cotton on **quarter  
pound, half pound and  
one pound spools**, one  
dozen spools in a box.  
Our spooled **Half Wire** is  
the best in the market.

FOR SALE TO THE TRADE BY

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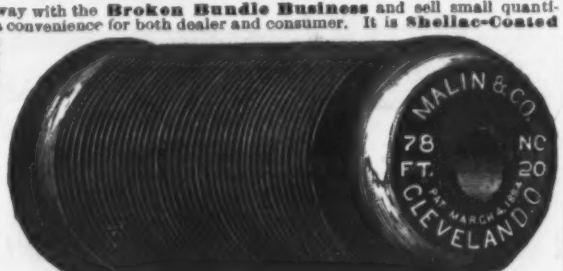
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SPECIAL WIRES FOR MANUFACTURING PURPOSES ON ANY SIZE OF SPOOL.

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Manufacturers and the Trade are warned not to infringe on our patent, No. 294,700, either by manufacturing or selling.



sparred vessel. They are special screw  
dispatch ships, and are unarmed, of  
course. The Mercury, which is to join Ad-  
miral Hornby's squadron, has an armament  
of ten 64-pounders. She is built of steel, and in  
proportion to her tonnage has been one of  
the most costly vessels afloat. Her hull and  
machinery cost altogether somewhere about  
£109,000, or within £10,000 or £15,000 of the  
Iris, which has been said to be as costly per  
ton as the ironclad Inflexible.

**Our Patent System and Its Defects.**

Considering the number of patents that are  
issued each year, and also the number that  
are at present in force, it is fair to assume  
that the public at large are interested in the  
work of the Patent Office and in the general  
patent system of the country. There are very  
few industries, indeed, which are not more  
or less fostered and sustained by patents, and  
much of the litigation that occupies the  
courts in all the States bears directly or in-  
directly upon patent rights. The Patent  
Office has for many years past been more  
than self-sustaining—that is, the fees which  
have been exacted from inventors have been  
in excess of the expense of conducting the  
department. That this is so, however, is in  
part explained from the fact that the Patent  
Office has no control over its own funds, and  
that it is denied what ought to be expended  
in the interest of its work. Whatever is col-  
lected in the way of fees is covered into the  
common treasury of the Government, and  
whatever is expended is grudgingly appropri-  
ated by Congress. The result of this man-  
agement is a handsome balance to the  
credit of the Patent Office, but the plan is  
greatly opposed to the best interests of the  
patent system and to inventors at large.

The United States Patent Office stands in  
great need of many facilities and conveni-  
ences which would materially assist in its  
work, and which a more liberal policy would  
secure. It is short-handed in many divi-  
sions, and is lacking in various respects that  
would be unnecessary were its own funds  
expended as they should be. This, it seems  
to us, is great injustice to inventors as a  
class, and is directly opposed to the interests  
of those industries which depend in a great  
measure upon patents. Among the more  
pressing needs of the office at the present  
time which are apparent to outsiders there  
may be mentioned the want of a larger ex-  
amining force and the creation of several  
additional classes, so that work would not  
only be dispatched more rapidly, but also  
that greater care could be taken in those  
investigations which determine whether an  
application for a patent shall be answered  
affirmatively or denied. Another need that  
is conspicuous to any one who examines the  
internal working of the office is the want  
of more references available to examiners.  
There are conspicuous gaps or omissions in  
the files of the office which very often leave  
examiners in doubt as to the propriety of  
allowing certain claims. A comparatively  
small amount of money expended in this di-  
rection would be of great benefit to the country  
at large, since it would prevent the granting  
of many patents of a doubtful character, the  
existence of which often leads to costly litigation.  
Our patent system at present is so conducted  
that there are too many patents issued in  
proportion to the inventions made. There  
are very few classes in which the ground  
has not already been more or less covered  
by inventors, and accordingly what most  
readily suggests itself is the recombination  
of old elements, thereby securing modified re-  
sults. The very slight novelty which the  
office at present recognizes as being suffi-  
cient to warrant granting a patent tends in  
itself to reduce the value of all patented  
property. If the standard was made higher,  
and if greater facilities for search were pro-  
vided, very advantageous results would  
follow.

Much has been done in the office during a  
few years past in the way of index files, but  
an intelligent system of cross indexes which  
would facilitate searches by taking into  
account correlated industries would facilitate  
the work of the office very much, and is  
something the office should have in order to  
make much that has already been done fully  
available. Still another defect in the system  
may be mentioned. There is, we believe, no  
provision at present by which an examiner  
or an assistant examiner can leave the office  
to investigate the state of an art in any par-  
ticular direction. An examiner may be  
sure, for instance, that he has seen a certain  
form of railroad switch or railroad frog in  
use years before in a certain place, but when  
an application for a patent on that identical  
thing comes from an inventor in another  
section of the country, and the records of  
the office do not show the invention, he is  
forced to pass the application. In rare in-  
stances inventors have been known to pay  
the traveling expenses of examiners in order  
to show up their inventions and to give them  
a correct idea of the state of the art and the  
measure of their improvement. But, unless  
an inventor or some other interested person  
defrays traveling expenses of this kind,  
the cost of such trips falls upon the  
individual examiners. It is needless to say  
that under these circumstances compara-  
tively few trips of the kind are made. So  
rigorous are the rules in this respect that in  
one instance that has come to our knowl-  
edge an examiner was even charged against  
his legal vacation with one day's time that  
he had spent away from the office on busi-  
ness of this nature. In order to con-  
scientiously perform his duties he had paid  
his own expenses and had taken a day's  
time to investigate the operation of certain  
machinery on which a patent was pending.  
On applying for his usual vacation a long  
time afterward he found the day off for this  
purpose had been charged against him.

The room allotted to the Patent Office is at  
present insufficient for its needs. The Patent  
Office is a subdivision of the Interior  
Department, and other offices of the various  
branches of the Interior Department are  
quartered in the so-called Patent Office  
building. Were the entire building devoted  
to the needs of the Patent Office, this  
complaint of lack of space would have  
no foundation. As it is, however, the cor-  
ridors of the building are of necessity used  
to hold cases and files that belong in the  
examiners' rooms. There is confusion in

various directions which more room would  
remedy. We might enumerate still other  
needs, but enough has been presented to  
show that a change in the matter of appro-  
priations would be advantageous. It scarcely  
needs argument that the money derived  
from patent fees ought to be expended in  
furtherance of the patent system. It is the  
inventors' right. Just what legislation is  
necessary to carry out this plan it is not our  
purpose at present to discuss. If the Patent  
Office could be divorced from politics, if  
civil service in its highest and best sense  
could prevail in its management, and if  
commissioners of patents could be found who  
are not only competent men, but who would  
accept the office as a trust to be held for  
years, instead of a short time until the op-  
portunity of entering upon a profitable pri-  
vate business presented itself, still greater  
advantages would be gained.

**The Florence Lamp Stove.**

The Florence Machine Company, Florence,  
Mass., are manufacturing the article named  
above, which is represented in the accom-  
panying illustrations, Figs. 1, 2 and 3. By  
this article a double purpose is served, as in-

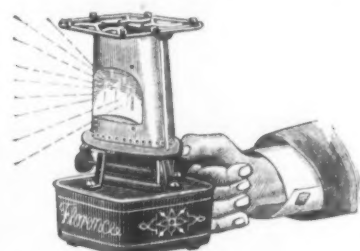


Fig. 1.

indicated by its name. Fig. 1 shows the stove  
lighted and used as a lamp by means of mica  
window introduced into the metal chimney.  
Fig. 2 shows something of its construction,  
the metal chimney being hinged in the man-  
ner represented, so that it may be readily  
turned over out of the way for lighting and  
trimming the wick. The chimney also is de-



Fig. 2.

scribed as reversible—that is, the mica can be  
held in the position shown in Fig. 1, or be  
reversed so that the flame is in full view  
when placed upon the table, as in Fig. 3.  
The reservoir is of cast iron, enameled in-  
side and out, and with an arrangement for  
ventilation in order to secure safety. The  
utility of this lamp stove and the effi-



Fig. 3.

ciency with which it does its work in giving  
both light and heat are explained by the  
manufacturers in their circulars relating  
to it.

**The Torpedo Ship Hecla.**

One of the most interesting ships of the  
British navy is the Hecla. She is not so  
much a fighting ship as a depot for fighting  
ships. She was originally a merchant ves-  
sel, and was purchased by the Government  
and converted into a torpedo ship. She is a  
torpedo ship in a very especial sense. She  
has her own ports for the dispatch of White-  
heads on her own account; she has exten-  
sive workshops for the repair of all kinds of  
torpedo mechanism and appliances, and she  
has on board of her a large flotilla of swift,  
second-class torpedo boats—torpedo boats,  
that is, that are not capable of maintaining  
an independent existence at sea, but are  
necessarily attached to some larger vessel.  
In any naval engagement the Hecla could  
not only on occasion hurl out her own deadly  
missiles, but could send out a whole brood  
of these ugly ducklings, who have every capa-  
bility of independent action while afloat, but  
who, having done their spiteful work, would  
make for the parent ship and be hauled on  
board. These are second-class torpedo  
boats as distinct from first-class, which are  
small sea-going vessels that may, on a  
pinch, make long voyages by themselves.  
One of them a short time since went  
to Australia by itself. Of the second class  
torpedo launches the Hecla has several, and  
what with these and her own boats this fine  
ship has the appearance of being quite a  
fleet in herself. She is among the longest  
ships in the British navy, her length being  
over 300 feet, and from end to end of her  
she is full of deadly stores for the supply of  
the fleet to which she is attached, or of  
deadly engines for her own independent use.  
Apart from her torpedoes, however, her  
armament is nothing very great in these  
times. She has five or six 64-pounders,  
beautiful-looking guns, bright as new pins—  
as, indeed, everything is about the ship—but  
of no great power. Among the curiosities  
of defenses is the protection of her cylinders



## INFRINGEMENT OF JOHN WILSON'S TRADE MARK, MASSACHUSETTS, U.S.A.

JOHN WILSON'S  
BUTCHERS' KNIVES,  
BUTCHERS' STEELS,  
and  
SHOE KNIVES.

TRADE MARK



REGISTERED IN ENGLAND,  
WASHINGTON, U.S.A.,  
AUSTRALIAN & OTHER  
BRITISH COLONIES &  
GERMANY

**ACKNOWLEDGMENT AND AGREEMENT.**  
"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercorns and a diamond, under the mistaken belief that I had the right to do so.  
NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and  
SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1885.

WITNESSES:  
E. M. REED,  
(Attorney for Defendant.)

G. A. ROBINSON. L.S.

Imitation  
J. WILSON  
SHEARSTEEL  
Mark

WORKS—SYCAMORE ST. SHEFFIELD ENGLAND. Established 1750

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Strops and Dressing Cases.

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We make the largest and most complete line of Razor Strops ever offered to the trade, including every description and style known. Our Razors are the Standard for excellent cutting quality and elegance of finish, and our prices lower than foreign makers of similar grade. Our Toilet Sets and Dressing Cases are designed for practical use and are made in various attractive styles.  
Send for Illustrated Price List—free to the Trade.

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MANUFACTURERS OF  
Razors in all Styles.

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94 Chambers Street, New York,

DEPOT FOR

O. AMES &amp; SON'S

## SHOVELS, SPADES AND SCOOPS.

E. W. Gilmore & Co.'s Strap and T Hinges.  
A. Field & Son's Tacks, Brads, Nails, &c.  
W. & S. Butcher's Edge Tools.  
Nicholson's File Co.'s Files.

Russell Jennings' Auger Bits  
Geo. Nelson & Co.'s Hatchets, Hammers, &c.  
American Screw Co.'s Wood, Machine and  
Screws, Store and Tire Bolts Rivets, &c.  
Brade's Brick Trowels.

GENERAL HARDWARE.

GUARANTEED  
"GILBERTSON'S OLD METHOD"  
Extra Coated Roofing Plates.

In view of the fact that we guarantee the "Gilbertson's Old Method" to be a heavier coated plate than either "M. F." or "Old Style," and, if not found so, boxes to be held subject to our order, the following letter, recently received by this firm (unsolicited on our part), is of value, as it comes from a roofer having many years' experience:

GUARANTEED

MONROEVILLE, O., Dec. 22, 1884  
Messrs. MERCHANT & Co.,  
Philadelphia, Pa.  
Dear Sirs: After 25 years' experience running a tinshop, doing roofing work, &c., I am free to say that I have never seen any plate that equals the "Gilbertson's Old Method" Tarsus lately purchased of you. It is all you claim for it, and on my own buildings I shall use no other, and shall try and have my customers let me use it for them, as I consider it economy to do so.  
Yours truly,  
R. G. MARTIN.

MERCHANT &amp; CO.,

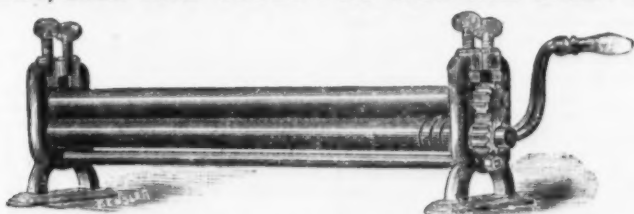
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PRESSES, DIES AND TOOLS FOR WORKING SHEET METAL,



Fruit Can Dies and Tools, Cannery's Outfits, Squaring Shears, &amp;c.

P., S. &amp; W. CO.'S TINNERS' TOOLS AND MACHINES,

147 &amp; 149 Elm St., BUFFALO, N. Y.

WRITE FOR OUR CATALOGUE AND PRICE LIST.

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## RICHARD DUDGEON,

No. 24 Columbia Street, New York.

Maker and Patentee of the Improved

Hydraulic Jacks

AND

Punches.

Roller Tube Expanders and Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.  
Jacks for pressing on Car Wheels or Crank Pins made to order.

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ESSEX, ESSEX CO. NEW YORK.



## The Essex Horse Nails

Are drawn from the best Swedes Iron Rods only. They are hot-forged and cold-pointed, rendering them tough, stiff and easy driving, and are warranted

FIRST-CLASS IN EVERY RESPECT.

All Nails branded "ESSEX" are Fully Guaranteed.

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JOSEPH RODGERS &amp; SONS'

(LIMITED)

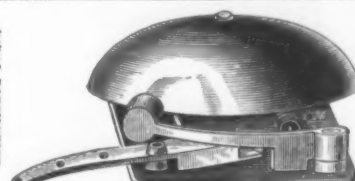
CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. &amp; W. CLATWORTHY, AGENTS.

The demand for JOSEPH RODGERS & SONS' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power.  
To distinguish articles of JOSEPH RODGERS & SONS' manufacture, please to see that they bear their Corporate Mark.

Established 1838.



BEVIN BROS., MFG. CO., Easthampton, Conn.,  
Manufacturers of  
Sleigh Bells, House, Tea Hand, Gong Bells, &c.

## MONTGOMERY &amp; CO.,

IMPORTERS

Stubs' Files, Tools and Steel, Grobet Swiss Files,

CHESTERMAN'S TAPES, RULES, ETC.,

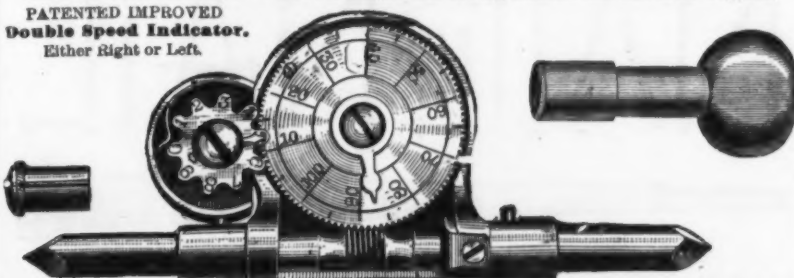
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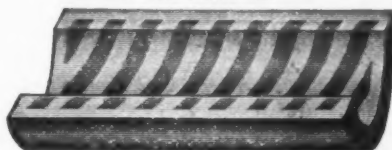
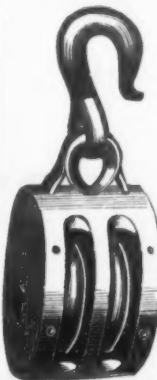


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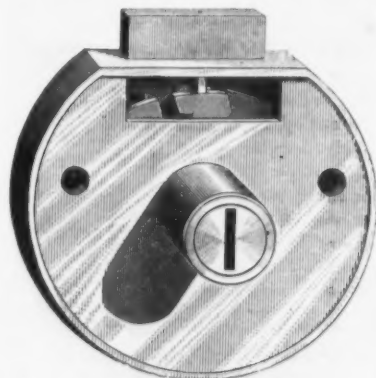


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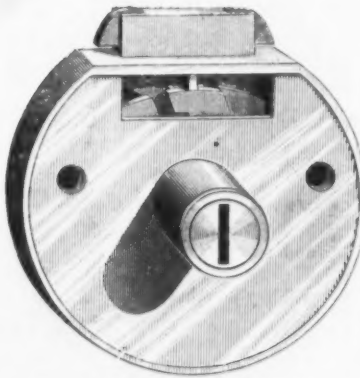
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and boilers by her coal bunkers, packed full of coal, with thin iron plates intervening. This is an ingenious adaptation of her merchantman structure to purposes of defense. Engines and boilers in all fighting ships built for fighting are placed low down, out of the way. The Hecla's, on the contrary, are high up in the ship. The hull of the vessel is divided into seven water-tight compartments, so that it would probably take several holes in her bottom to sink her, and she has the further protection of a torpedo net extending around her at the end of the booms. She is an iron ship and has two iron decks.

## SCIENTIFIC AND TECHNICAL.

## Band-Saws in Sawmills.

Referring again to the subject of band-saws in sawmills, the *Lumberman* prints a letter from J. Cummer & Son, of Catillac, Mich., to the Stearns Mfg. Co., of Erie, Pa., from which we quote the following:

"We started the band mill about three weeks ago, and from the beginning it has effectually demonstrated its merit. The sawing is very accurate and remarkably smooth, an allowance of 1-32 for dressing being ample, and the capacity is all that could reasonably be expected with inexperienced hands, our sawyer never having used or even seen a band mill before. From the start we have maintained an average production of more than 20,000 feet of inch boards, over 6 to the 1000, and including daily 10 hours—with logs running not two days on Norway logs, running 15 to the 1000. We carry a feed, after canting down, of 9 1/4 inches, but with the 10-inch pinion we have requested you to send, to take the place of the 8 inch now on mill, we can increase this to about 12 inches, which we are confident may be safely carried in upper stock. The saw is 16 gauge, cutting 1/8-inch kerf, and is changed on usual quarter time, consuming from four to six minutes in changing. The entire mill is very solid and heavy, and the 9-foot band-wheels run without a tremble. In short, the mill in all its parts is a complete success, and it affords us real pleasure to so testify. Prior to placing our order with you for the band mill, and aware of its rather experimental character as a practically valuable factor in the manufacture of lumber, we investigated the subject very thoroughly, by personally inspecting the construction and operation of the principal mills, finally selecting yours because it seemed to us that it incorporated to a greater degree than any of the others the particular features our observations had led us to regard as vital. That we are pleased with our choice our words prove, and, as an act of greater significance perhaps than words, the Cummer Lumber Company, have just wired you an order for a duplicate mill, except with steam instead of friction feed. This will take the place of their present circular."

## A "Telpher" Motor.

Considerable interest has been aroused, says the *London Electrical Review*, by an experiment which is shortly to be made at the Sussex Portland Cement Works, at the small village of Heighton, near Newhaven. It is proposed to carry the clay from these works by electricity. A "telpher" motor, running on a single steel rod, is to serve as a locomotive, dragging behind it a number of trucks. The line, which will be formed of a 3/4-inch steel rod, resting upon cast-iron saddles, and supported by brace-posts and a cross-beam, will be raised, as a rule, about 12 feet above the ground, but in some instances 16 feet. The supports will be about 66 feet apart. There is to be an "up" line and a "down" line. It is stated that it is incomparably cheaper to build a "telpher" line in the air than to lay a line of double rails on the ground, requiring bridges, foundations, &c. The engine is stationed near the Glynde station, at a point where the telpher line crosses the Glynde reach. The buckets conveying the clay are carried to the special siding, where they tip themselves over and empty their contents into the trucks held in readiness beneath, and which are in due course run along the railway to the Heighton Works. So confident is the company controlling Prof. Fleming Jenkins's patents of the success of this new method of locomotion, which is now to be tested for the first time on a large scale, that it has undertaken to erect the Glynde line entirely at its own expense, and to take all risk. It has also bound itself to convey for a year 150 tons per week of the clay, and if not successful in so doing to bear the entire loss.

## Putting Bolts Through a Retaining Wall under Water.

During the progress of some works in England, several 2-inch bolts had to be put through a wall forming the side of a canal at a depth of about 10 feet below the water line. Thinking that an account of the way in which this was done might be of interest to others, Mr. C. Reynolds, of Bow, who had charge of the work, sent to *Engineering* the following description of the means and apparatus used:

The wall in question was built of concrete, with a facing of hammer-dressed Kentish ragstone, coursed, forming a very uneven surface, as the stones were of large size, and in many cases the center portion of the face of the stones projected as much as 6 inches from the line of joints, the cement in which, however, was intact. The face of the wall being so uneven, it was necessary that it should be dressed off under the washers in order that they should take a fair bearing. The bolts and washers being then placed in position, the whole was then grouted solid with cement. To do this cheaply and expeditiously, and at the same time not to interfere with the traffic in the canal, a caisson of special construction was used, consisting of a box with three sides and a bottom (the side next the wall being left open), which was lowered down to the required depth from the top of the wall. A water-tight joint being then made between the edges of the caisson and the wall, it was then pumped out, leaving that portion of the wall dry to which it was desired to fix the washers and bolts. The method of making a joint between the caisson and the wall was as follows: As before stated, the caisson was similar to a box consisting of three sides

and a bottom. Its dimensions were 4 x 3 x 11 feet deep, which was found to afford convenient room for the suction-pipe of the pump and a man to work. It was lowered into position with the open side to the wall. The top of the caisson being open and above water, afforded a free passage for men and materials. It will be seen from the above that, when the caisson was thus in position, the edges of the bottom and sides rested against the face of the wall. Round these edges a breadth of tarpaulin was nailed, extending outward for a breadth of 4 feet all round, and lying flat against the face of the wall. A 1/2-inch chain was sewn on allround the outer edge of the tarpaulin, to make it lie "dead" against the wall and prevent it being curled up or washed away by the currents caused by the passing traffic in the canal.

For pumping out the caisson a pulsometer was used capable of discharging 9000 gallons per hour, the idea being that the current caused by pumping out the caisson would cause the tarpaulin to be drawn in tight against the wall, thus making a joint similar to that made by a limpet on the rocks of the seashore. On this being done it was found that the current obtained by pumping was totally inadequate, as the tarpaulin, resting nominally on the higher portions of the face of the wall, left considerable spaces between it and the face of the wall at the joints, thus affording so large an area for the ingress of water that the current caused by the pump was practically nil. On considering the matter it was seen that what was wanted was an instantaneous emptying of the caisson, when the rush of water would be so great as to carry the tarpaulin before it into the interstices between it (the tarpaulin) and the wall. But, as this was impracticable, the same effect was produced in the opposite way, namely, by the instant filling of the caisson. To do this the open side of the caisson next the wall was boarded up water-tight with the exception of the lower portion, where an opening was left 4 x 3 feet. To this opening a shutter was fitted, closing from the inside and held in position by a strut. The caisson, being now a water-tight box, was lowered into position, and any leakage which had come in around the shutter having been pumped out, the strut supporting the shutter was knocked away, allowing it to fall inward, leaving an opening 4 x 3 feet for the water to rush in. The effect of this was all that could be desired; the joint was instantaneously made, the leakage was very slight, about 600 to 700 gallons per hour, which was easily kept down by the pump. To break the joint when it was required to move the caisson to another part of the wall, the shutter was replaced from the inside. The space then left between the outside of the caisson and the wall filled up by leakage when the tarpaulin floated off the face of the wall. The caisson was weighted sufficiently to prevent its floating up when pumped out. A rock drill was used to bore the bolt holes, which were 2 3/4 inches in diameter, and were drilled the full length (6 feet 6 inches) in 40 minutes.

## Pilot Balloons and Aerial Navigation.

Mr. F. A. Gower, the inventor of the Gower telephone, is making a series of experiments in aerial navigation or ballooning under the "cognizance" of the Government. He has made Hythe the center of his operations, whence he recently started a pilot balloon containing about 2300 feet of gas, with automatic arrangements for giving out ballast and gas. This balloon made a descent near Dieppe, having made a rapid passage of 72 miles in a straight direction. Recently another pilot balloon, with a capacity of 4300 feet, was started, and immediately followed by Mr. Gower in a larger balloon containing 23,000 feet of gas. His object was to watch the action of the pilot; but the smaller machine made such rapid progress that it got out of his observation and came down in the vicinity of Paris. Meanwhile Mr. Gower, who ascended about noon, made the French coast at Boulogne at 2.15, and then, taking a northerly curve, traveled overland to Calais, where he made a smooth descent at 4 p. m. He next made an ascent with Captain Lane and Mr. Dale, but, owing to the wind drifting them to the North Sea, they were compelled to descend, and landed in the Isle of Sheppey. Experiments will be made on all favorable opportunities.

## Composite Photography.

Mr. W. Curtis Taylor, of Philadelphia, who presented the results of his experiments in composite photography at the last meeting of the Franklin Institute, gives the following description of the method which he has employed to produce his composites, which he believes to be the simplest and surest. By Mr. Taylor's method the objects to be combined are first photographed to one size, and the unmounted prints are fitted one over another—eyes to eyes and mouth to mouth. In order to make this adjustment accurately, a light open frame, perforated at each corner with a small hole, is made to fit on a block having corresponding pins on its corners. The frame bears cross-threads agreeing with the lines of the eyes and mouth of the picture, and with the average distances apart of the eyes. This frame, apart from the block, is placed on the first print, and the threads being brought into correspondence with the features named, punctures are made in the print through the holes in the frame, and the print is then slid upon the pins in the block. All the prints are adjusted to their places in the block in this way. They are then each successively exposed before the camera for such a proportion of time as the number of prints may indicate. For example, if 60 seconds were required for an ordinary exposure, 12 prints would receive five seconds each. The sensitized plate in the camera is thus acted on by a number of images producing one compound image, in which the separate characteristics of all have equal representation.

Mr. Ellis Lever, of Bowdon, England, some time ago offered a premium of £500 for the best substitute for powder for blasting in coal mines, and has now renewed an offer of £500 for the best portable electric lamp to be used in mining operations.



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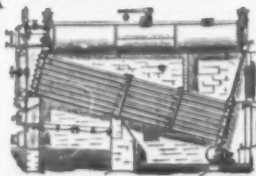
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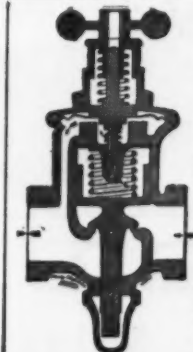
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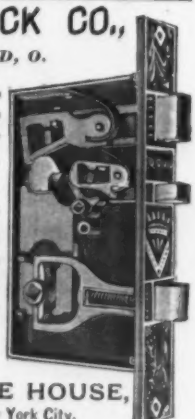
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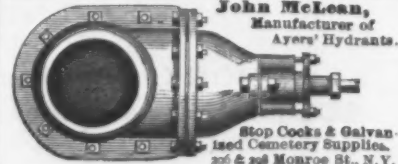
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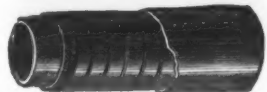
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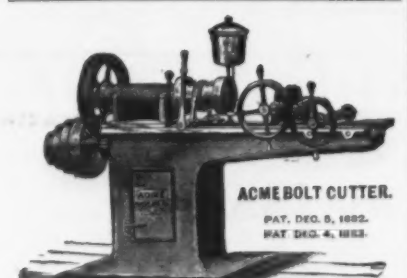
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Circular Woven Seamless Rubber Belt.



NO SEAMS OR JOINTS.

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IT IS THE BEST BELT

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It will not "break" at point of Lacing.

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**Merrill Brothers,** 26 First Street, BROOKLYN, N. Y. **DROP** HAMMERS, FORGINGS and POWER PRESSES.**English Letter.**

(From Our Regular Correspondent.)

LONDON, June 15, 1885.

THE WEEK

has brought a change of ministry with us, very much to the surprise of the general public, who had pretty much made up their minds that the Liberals would manage to run along until the time for holding the general election at the end of the year. To those behind the scenes, however, it has been evident for some time past that the ministry has been in trouble, and that even Mr. Gladstone could hardly keep together a Cabinet in which there were at least two parties decidedly hostile to each other. The affair seems to have been cleverly managed so as to avoid the necessity of a split in the Cabinet on the bill for renewing the Coercion act for Ireland. The Liberal ministers have resigned, and, having persisted in their resignation after the usual polite hesitancy on the part of the Queen, the Marquis of Salisbury has been entrusted on behalf of the Conservative party with the formation of a new Cabinet. As the Conservatives are in a considerable minority in the House of Commons the new Premier is said to have accepted office only on the understanding that for the brief remainder of the session he shall not be harassed on purely departmental matters, but shall be assisted by the Liberals in getting supplies voted, and that sort of thing, leaving all controversial matters to be dealt with by the new House of Commons to be elected in November or December. Thus a sort of coalition seems to be probable, and we are certain to have no startling legislation this year. What may happen afterwards nobody knows and nobody seems to care very much. The new reform bill will add a great many electors to the register, and the popular idea is that they will vote very largely for the Radical candidates. I do not regard this, however, as being anything like a certainty, and, even if so, I fancy there will be checks in operation in other directions. For one thing, it is likely that the Whigs (or old-fashioned Liberals, who are tenacious office-seekers and far behind the modern Tories or Conservatives) may forsake the advanced party and elect to throw in with the Tories. Then, again, the Home Rulers will be more powerful than before, and are not unlikely to hold the balance of power in the House. Further, the plethora of Radical and Liberal candidates is so great that they are not unlikely to so "water" the voting powers of the constituencies that they may let in the Conservatives. Lastly, the Fair Traders will exert their utmost strength, and are extremely likely to carry their men in many of the Northern towns, where the manufacturing operatives have been so badly pinched by the hard times that they will probably vote for anything which seems to promise, however vaguely, a revival of activity. It is in this last respect that there is most curiosity relative to the new Government. They are being strongly urged to consent to an inquiry into our fiscal system and the causes of the trade depression. I should not be surprised if they consented to appoint a Parliamentary commission on this head, with plenary powers of inquiry. At the same time I do not for a moment believe that any Government of this country will propose to reverse our free-trade policy. Some of the Conservatives have trifled with the subject, but the leading men of the party have declared that we can never again resort to protection in any form. That was while they were out of office; what might happen under pressure cannot be foretold, but, as the matter now stands, I do not believe we are likely to have even a mild form of reciprocity.

The annual dinner of the Cobden Club took place on June 13th, when the principal speakers were Sir Charles Dilke and Mr. Chamberlain. The latter went into free trade versus protection at great length, and was especially strong in his arguments at the expense of the United States. He pointed out many industries with which we were killed by the duties on materials, particularly instancing the shoe trades, which with us are flourishing, while yours are moribund. He also alluded to France as another instance of the evils of protection, but so far as I gathered he did not allude in any way to the fiscal sins of Germany. That is curious, but it may perhaps be accepted as a proof that the raps administered by Prince Bismarck upon the knuckles of the late ministry have not been without a due and proper effect.

**THE IRON MARKET**

is still irregular, and for the most part weak. At Glasgow the week has been a quiet one in all respects, and there has been only a limited number of transactions in warrants, which closed at 41/15 p. ton. Scotch special brands of pig iron are 6d. @ 1/10 p. ton easier on the week, and are in moderate demand only, both for home use and shipments. Stocks continue to grow larger, although the production has not been increased, and are so very heavy in the aggregate as to prove an effectual bar to any considerable advance in values. At Middlesboro', pig iron is weak; indeed, there seems to be "no bottom" to the market, seeing that 32/6 is quoted for No. 8 foundry, and there are reports in circulation that even lower figures have been accepted. The returns for May discouraged the local trade, but a little recovery in tone has since set in, owing to the augmented shipments during the present month. Nevertheless, the market is decidedly dull, and the smelters cannot be said to have a promising outlook. On the West Coast the hematite pig-iron industry is unchanged on the basis of 43/ for mixed numbers in usual proportions. There is a fair business doing, but the quietude at some of the large steel-rail mills tends to restrict the consumption, which is still below the production; consequently, the already heavy reserve stocks are being gradually increased. Elsewhere there is general quietness in all grades of crude iron, and buyers have the best of the situation in almost all transactions. Price have fallen so low and competition is so close that we are not unlikely to witness the stoppage of several furnaces, especially

as a spell of hot weather would be likely to restrict operations at the finished-iron works, foundries, &c. In heavy iron and constructive ironwork there is a tolerably good turnover on dock-yard, railway, &c., account, but new orders are not plentiful, and the only departments which have work assured for some time ahead appear to be the armor-plate concerns at Sheffield. Fencing wire and galvanized iron are as dull as of late, and values are irregular, with keen competition for the export orders about. Ordinary finished iron is the same as it has been for a very long time past—that is to say, irregular in demand and equally irregular in price.

For Staffordshire marked bars the fiction is maintained of quoting 7/10 p. ton, but it is doubtful whether the full price has been paid in a single instance for months past, seeing that that class of iron is easily obtainable at 7/10, and perhaps a little less, p. ton. Good unmarked bars range from 26/5 to 26/12, medium at 25/15 to 26/5, and common at 25/5 to 25/12; the current demand is largely for common and medium sorts. Sheets are in moderate request for stamping purposes and working up generally, as well as for tin plates. The call for hoops, plates, angles, tube strip, &c., is not heavy. A tolerable business is being done in Swedish bars for India, Singapore, &c. Old materials are quiet. F. Pitts & Co., London, quote for old double-headed iron rails, 22/12/6; No. 1 heavy wrought scrap, 22/2/6; old boiler tubes, 22/2/6; old leaf-spring steel, 22/7/6; and old cast iron, 22/10/6. London or other good British port. Freight is nominally unchanged in all directions. With regard to the British Channel ports, Edwardes, Robertson & Co., Cardiff, say: "The average berth rate of freight for the month has been about 7/6 p. ton. The shipments for May compare favorably with those of the previous months of this year, and also with the corresponding months of the past few years. Since the war rumors have subsided, homeward rates of freight have fallen away and are now very low; this may shortly affect the outward market and cause a small increase in the rates. Steel is about the same as when last reported upon, with no increase of business at Sheffield, but with a fair amount of work in Bessemer and Siemens sorts. Mild-steel ship plates are being freely produced, but there are not many new orders in the market. Steel rails are unaltered at 4/15 p. ton for ordinary heavy sections, although some of the large mills have almost nothing to do. Some of the French works are said to have booked large orders for their home lines."

**SCOTCH PIG IRON**

continues very feeble indeed, both as regards warrants and special makers' brands. The amount of business doing is limited and speculators have no opportunity of making good profits. There are now 91 furnaces at work in Scotland, against 95 a year ago. Connal's stocks amount to 598,590 tons, compared with 599,037 tons this date 1884. Last week 724 tons were added to the stores. Shipments to date are 46,512 tons in arrears, while there is an increase of 54,442 tons in the imports from Middlesboro'. Current prices are:

Deliverable alongside.	No. 1.	No. 3.
Gartbarrie, at Glasgow.....	40/	45/
Coltness, ".....	50/	49/
Langloan, ".....	48/6	45/
Summerlee, ".....	52/	45/
Calder, ".....	47/	45/
Carnbroe, ".....	46/3	42/3
Clyde, ".....	41/6	39/6
Monkland, ".....	41/	39/
Quarter, ".....	41/6	39/6
Govan, at Broomielaw.....	49/	48/6
Shotts, at Leith.....	52/6	47/
Carroll, at Grangemouth.....	48/	42/6
Kinnell, at Bo'ness.....	47/	41/6
Glengarnock, at Ardrossan.....	42/3	39/
Eglington, ".....	44/6	41/6
Dalmellington, ".....		

**MIDDLESBORO' PIG IRON**

has no backbone or life in it, even though the shipments this month have been on a more encouraging scale. For G. M. B. f.o.b. at makers' wharves in the Tees, net cash, quotations are:

No. 1 Foundry.....	35/6	Mottled .....	32/
" 2 ".....	34/	White .....	32/
" 3 ".....	32/ @ 32/6	Refined Metal.....	49/
" 4 ".....	32/3	Kentledge.....	35/6
" 4 Forge.....	32/3	Cinder.....	30/6

**HEMATITE PIGS**

are dull, but steady. For North of England sorts, f.o.b. Cumberland ports, &c., prices are:

No. or quality.	Ordinary.	Bessemer.
1.....	44/	44/
2.....	43/	43/
3.....	43/	43/
4 Foundry.....	43/	43/
4 Forge.....	43/	43/
5 Forge.....	42/9	42/9
Mottled.....	42/	42/
White.....	41/	41/

West Coast brands are unaltered at about 43/ for mixed lots.

**THE BOARD OF TRADE RETURNS**

for May, briefly alluded to in my last letter, showed that the value of the imports during that month was £31,658,363, or £1,542,751 less than in May, 1884. The total value of the exports was £17,145,117, or £2,712,221 less than in the same month of the previous year. The aggregate quantity of iron and steel exported was 275,639 tons, worth £2,007,636, against 366,992 tons and £2,420,263 in May, 1884.

**TO THE UNITED STATES**

the figures for the leading lines of export reveal a great falling off and are as below:

Articles.	Month of May, 1885.	Month of May, 1884.	Month of April, 1885.
Alkali, cwt.....	299,196	304,574	310,280
Hardware and cutlery, £.....	16,733	27,014	18,100
Iron—Pig, tons.....	27,806	52,091	11,373
Bar, angle, rod, &c., tons.....	1,657	3,579	1,132
Railroad, all, tons.....	9,500	325	2,937
Hoops, sheets, plates, &c., tons.....	881	777	312
Tin plates, tons.....	23,645	28,154	21,221
Cast or wrought, tons.....	127	534	146
Old, tons.....	104	3,471	858
Steel, unwrought, tons.....	1,356	1,140	630
Lead, all sorts, tons.....	61	31	25
Steam engines, &c., £.....	2,007	1,080	2,336
Other machinery, &c., £.....	14,645	24,235	15,132
Tin, unwrought, cwt.....	555	302	300
Special return—Steel rails, tons.....	1,842	50	2,790

According to these statistics our business with you will soon be worth nothing at all except in respect of tin plates and occasional lots of machinery.



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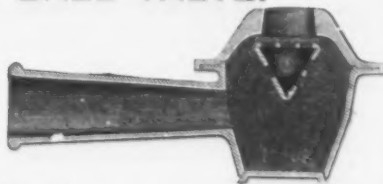
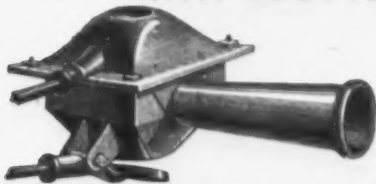
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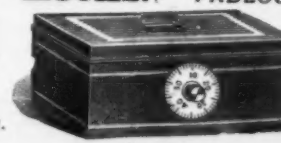
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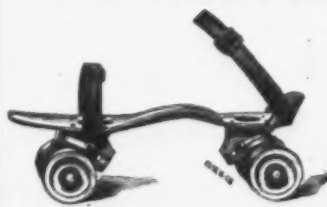
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**PENN HARDWARE WORKS,**  
READING, PENNSYLVANIA

MANUFACTURERS OF

Frame and Axle Pulleys, Hat and Coat Hooks, Shelf Brackets, Locks, Mineral and Porcelain Door Knobs, AND A LARGE LINE OF BUILDERS' HARDWARE.  
Send for Illustrated Catalogue and Price List.

#### TIN PLATES.

In London values are somewhat better this week, and the standard price is more clearly understood than was the case last week. Most of the makers are reported to show no particular anxiety to book orders for cokes, even at 13/6 f.o.b. Liverpool, and some of the works are fairly looked for some weeks to come. On the other hand, American buyers are not active by all accounts. Still, in spite of this and the rumor that a proportion of the mills which have stopped will very shortly restart again on the strength of the improvement in prices, there is in some quarters a hopeful feeling that, should the makers enter into a compact to stop their mills one week in every month—a proposal which may be definitely decided this week—there will be a substantial improvement on present prices, even to the extent of 1/4 or may be 2/4 box. Australia and the Continent have been sending some very fair inquiries for both plates and sheets. I quote ordinary IC cokes 13/6 @ 14/ f.o.b. Liverpool. At Liverpool the market for tin plates has become rather quiet again. There is some uncertainty as to the makers acting in concert in carrying out a real reduction in the make, as they have been hesitating even to pass a resolution for a combined movement to this effect. This, together with the drop in the price of tin, has been the means of keeping buyers out of the market rather more than usual. They are well aware that unless combined action is taken and the make materially reduced there will be more than enough plates always on hand and ready at any moment to be used as a lever to depress the market with. This, of course, simply means that the reign of low prices will be continued for a prolonged period. The inquiries this week have been pretty equally divided between coke tin plates and Bessemer steel plates with coke finish, and next to these come Siemens steel plates in coke grades. The inquiries for the latter are very good, and the trade in these plates is very steady and regular. The business in charcoal tin plates still lags behind considerably. Compared with what it was in former years and with other branches of the tin-plate trade, fewer orders are coming forward now than ever. There is no change in prices, which, however, are very low. More, however, is doing in charcoal tins, the orders having come forward of late pretty regularly, though the numbers at a time are not large. Ordinary good brands are still to be had from 13/6 to 14/6 IC. In best charcoal tins there is more doing. A few good orders are to hand for deep stamping and other good qualities in leading brands. The coke-tin wasters business is not so brisk again; there are fewer wanted and more offering; hence 12/ @ 12/3 are the utmost figures obtainable for ordinary sorts. Slightly better figures may be obtainable for choice brands. At the close of the week, business generally was not so brisk, buyers being rather more inclined to hold off yet a while. The attitude of makers toward the reduction is not reassuring, and, as all depends upon the supply and demand being equalized, it comes to this, that, unless a change takes place soon, business will be allowed to slide into the old groove again. The shipments during last month were well kept up—something like 35,000 boxes all told. This is a fairly good average, and yet stocks seem to be on the increase on this side, though not so on the other side. Coke tins are now quoted firm at 13/3 @ 14/3; Bessemer steel, 13/6 @ 14/; Siemens steel, up to 14/6.

#### Transportation of Petroleum to the Seaboard.

The interest in the late project for forcing water for army purposes over the broken and elevated country between Suakim and Berber by means of pipes has called attention to the extent, importance and utility of the pipe lines in our own country, which convey the crude petroleum of the region lying between the Alleghenies and Lake Erie to shores of that lake and the Atlantic seaboard. Engineering News has gathered a number of facts on the subject and has presented them in a valuable article, accompanied by a map.

The exploitation of these regions by means of artesian wells began about 26 years ago. By June, 1862, 495 wells had been sunk near Titusville, and the daily output was nearly 6000 barrels, selling at the wells at from \$4 to \$6 a barrel. But, as the production increased with rapid strides, the market price fell with a corresponding rapidity, making the transportation charges to New York City a considerable proportion of the total cost. The question of reducing these enormous transportation charges was first broached, apparently, in 1864, when a writer in the Philadelphia North American outlined a scheme for laying a pipe line down the Allegheny River to Pittsburgh. Originally the oil was carried in 40 and 42 gallon barrels made of oak and hooped with iron; afterward tank cars were introduced. These were at first ordinary flat cars upon which were placed two wooden tanks shaped like tubes, each holding about 2000 gallons. On the rivers, bulk barges were also after a time introduced on the Ohio and Allegheny. At first these were rude affairs, and often of inadequate strength, but as now built they are 130 x 22 x 16 feet in their general dimensions, and divided into eight compartments, with water-tight bulkheads. They hold about 2200 barrels. In 1871 iron tank-cars superseded those of wood, with tanks of varying sizes, ranging from 3856 to 5000 gallons each. These tanks were cylinders 24 feet 6 inches long and 66 inches in diameter, and weighed about 4500 pounds.

Among the very first, if not the first, pipe lines laid was one put down between the Sherman well and the railway terminus on the Miller farm. It was about 3 miles long, and designed by a Mr. Hutchinson. He had an exaggerated idea of the pressure to be exercised, and at intervals of 50 to 100 feet he set up air chambers 10 inches in diameter. The weak point in this line, however, proved to be the joints. The pipes were of cast iron, and the joint leakage was so great that little, if any, oil ever reached the end of the line, and the scheme was abandoned

in despair. In October, 1865, the Oil Transportation Company completed and tested a pipe line 32,000 feet long. Three pumps were used upon it—two at Pithole and one at Little Pithole. The first plans to extend such lines to the seaboard seem to have been made in 1876, when the pipe-line owners held a meeting to organize a pipe-line company for this purpose, but the scheme was never carried out. In January, 1878, the Producers' Union organized for a similar seaboard line, and laid pipes, but they never reached the sea, stopping their line at Tannemund, Pa. About four years ago the National Transit Company were organized, and succeeded to the properties of the American Transit Company. Their lines were completed in 1880-81, and this company, to which the United pipe lines have also been transferred, are said to have \$15,000,000 invested in plant for the transport of oil to tidewater. They operate a total of 850 miles of main pipe line alone, ranging from 4 inches to 6 inches in diameter, or, adding the duplicate pipes on the Olean New York line, we have a round total of 1330 miles, not including loops and shorter branches and the immense network of the pipes in the oil regions proper.

A general description of the longest line will practically suffice for all, as they differ only in diameter of pipe used and power of the pumping plant. This long line starts at Olean, near the southern boundary of New York State, and proceeds by the route indicated to tidewater at Bayonne, N. J., and by a branch under the North and East Rivers, and across the upper end of New York City, to the Long Island refineries. This last-named pipe is of unusual strength, and passes through Central Park. The following table gives the various pumping stations on this Olean New York line, and some data relating to distances between stations and elevations overcome:

Pumping stations.	Miles between stations.	Elevation above tide.	Greatest summit above tide.
Olean.....		Feet.	Feet.
Wellsville.....	28.2	1,490	2,490
Cameron.....	37.91	1,042	2,590
West Junction.....	39.7	911	1,917
Catawunk.....	37.37	869	1,768
Osborne.....	37.99	1,092	1,539
Hancock.....	39.86	925	1,878
Cohecton.....	36.22	748	1,854
Swartwout.....	28.94	475	1,478
Newfoundland.....	29	735	1,405
Saddle River.....	28.77	35	398

On this line two 6-inch pipes are laid the entire length, and a third 6-inch pipe runs between Wellsville and Cameron, and about half-way between each of the other stations "looped" around them. The pipe used for the transportation of oil is especially manufactured of wrought iron to withstand the great strain to which it will be subjected. The pipe is made in lengths of 18 feet, and these pieces are connected by threaded ends and strong sleeves. The pipe-thread and sleeves used on the ordinary steam and water pipe are not strong enough for the duty demanded of the oil-pipe. Up to 1877 the largest pipe used on the oil lines was 4 inch, with the usual steam thread; but the joints leaked under the pressure, 1200 pounds to the square inch being the maximum the pipe would stand. This trouble has been remedied by the pipe of the present day, which is tested at the mill to 1500 pounds pressure, while the average duty required is 1200 pounds. As the iron used in the manufacture of this line-pipe will average a tensile test strain of 55,000 pounds per square inch, the safety factor is about one-sixth.

The line-pipe is laid between the stations in the ordinary manner, excepting that great care is exercised in perfecting the joints. No expansion joints or other special appliances of like nature are used on the line, so far as we can learn, the variations in temperature being compensated for, in exposed locations, by laying the pipe in long, horizontal curves. The usual depth below the surface is about 3 feet, though in some portions of the route the pipe lies for miles exposed directly upon the surface. As the oil pumped is crude oil, and this, as it comes from the wells, carries with it a considerable proportion of brine, freezing in the pipes is not to be apprehended. The oil, however, does thicken in very cold weather, and the temperature has a considerable influence on the delivery.

A very ingenious patented device is used for cleaning out the pipes, and by it the delivery is said to have been increased in certain localities 50 per cent. This is a stem about 2 1/2 feet long, having at its front end a diaphragm made of wings which can fold on each other, and thus enable it to pass an obstruction it cannot remove. This machine carries a set of steel scrapers somewhat like those used in cleaning boilers. The device is put into the pipe and propelled by the pressure transmitted from the pumps from one station to another. Relays of men follow the scraper by the noise it makes as it goes through the pipe, one party taking up the pursuit as the other is exhausted. They must never let it get out of their hearing, for, if it stops unnoticed, its location can only again be established by cutting the pipe.

At each station are two iron tanks 90 feet in diameter and 30 feet high. Into these tanks the oil is delivered from the preceding station, and from them the oil is pumped into the tanks at the next station beyond. The pipe system at each station is simple, and by means of the "loop lines" before mentioned the oil can be pumped directly around any station if occasion should require it. The engines vary in power from 200 to 800 horse power, according to duty required. They are in continuous use, day and night, and are required to deliver about 15,000 barrels of crude oil per 24 hours, under a pressure equivalent to an elevation of 3500 feet. The enterprise has been so far a great engineering success, and the oil delivery is stated on good authority to be within 2 per cent. of the theoretical capacity of the pipes. From a commercial standpoint the ultimate future of the undertaking will be determined by the lasting qualities of wrought-iron pipe buried in the ground and subjected to enormous strain. Time alone can answer this question.



### "A 40° BELOW ZERO AXE."

FRANCIS AXE CO.:

Gentlemen—In reply to yours of the 30th, "How are the axes turning out?" I am able to answer, first rate! No axe that I have sold in the past twenty-eight years has proved better. It has been a hard winter with us, and very trying on axes, yet not one has been broken. I had hard work at first to get them introduced, because of their extra cost. I did my best to get one very good but close-fisted customer to try a few in the early part of the season, but it was of no use. I told him at last that I was very glad he declined, as the weather was not then cold enough for them. They were a cold-weather axe; something about 40° below zero was about what was wanted to show their merit—when the sap in a pine tree was frozen solid as cast steel. The result has been that he is now using the Francis Axe, and won't have any other. This is also the experience with every customer I have sold to.

Yours, K. M. HUTCHINSON.

Oshkosh, Wis., Feb. 11, 1885.

### "MORE CONFIDENT IN THE SALE OF THEM THAN ANY AXE."

FRANCIS AXE CO.:

I have made them my leading axe for ten years, and have been very successful with them. We feel more confident in the sale of them than any axe we have handled, and would cheerfully recommend them.

Yours respectfully, A. KIMBALL.

Green Bay, Wis., Feb. 13, 1885.

Yankee,

Michigan.

### "FEWER RETURNED THAN ANY OTHER AXE."

FRANCIS AXE CO.:

We consider the "Francis Axe" the best of any brand we know. Have warranted more, and had fewer fail, than any axe we have ever handled.

Yours truly, S. H. CURTIS & SONS.

Waverly, Iowa, Feb. 10, 1885.

Western,

Dayton.

### "THE FINISH SUPERIOR TO ANY."

FRANCIS AXE CO.:

We have handled your axes exclusively for the past four years, and they have given entire satisfaction as to quality. The finish of this season's axes is superior to any we have ever handled.

Yours truly, S. F. MARTIN.

Atlantic, Iowa, Feb. 2, 1885.

Jersey,

Double Bitted

### "THE ALL-STEEL CANNOT BE EXCELLED."

FRANCIS AXE CO.:

Your axes have given the best of satisfaction here. The all-steel cannot be excelled in quality and finish.

Yours respectfully,

H. LOEWENSTEIN.

Charleston, West Va., Feb. 9, 1885.

### "NOT ONE RETURNED!"

FRANCIS AXE CO.:

We are well pleased with the "Francis Axe." Have had none returned, and not a single complaint.

Yours truly, JAMES REDHEFFER.

Kansas City, Mo., Feb. 2, 1885.

### "A REMARKABLE RECORD."

FRANCIS AXE CO.:

Your axes have stood the severe frost of this winter better than any axe sold here. Out of fifteen boxes sold in January, less than half a dozen axes have been returned; and when we consider that the mercury averaged 15° below zero during that month, it is a remarkable record. Your Double-Bitted Axe gave perfect satisfaction.

Yours truly,

J. C. N. COTTRELL,

Faribault, Minn., Feb. 2, 1885.

## THE FRANCIS AXE COMPANY, BUFFALO, N. Y., MAKE THE BEST AXE IN THE WORLD.

READ THE VERDICT!

Order "THE FRANCIS AXE."



Hibbard, Spencer, Bartlett & Co.,

Nos. 24, 26, 28, 30, 32 Lake Street, CHICAGO, ILLS.,

AGENTS FOR THE NORTHWEST, JOBBERS OF

Hardware, Cutlery, Nails, Tin Plates, Sheet Iron,  
Barbed Fence, Guns, Agricultural  
Implements, &c.

### "GREAT SELLERS."

FRANCIS AXE CO.:

We are always pleased to praise real merit, and it is with the greatest pleasure that we add our testimony to the worth of your axes. They are well shaped, well made and "great sellers." Have had but one returned of those we sold in '84.

Yours, &c.,

DAY & HOLT.

Catskill, N. Y., Feb. 7, 1885.

### "THEY TAKE THE CAKE."

I have sold a good many "Francis Axes" to choppers in the Missouri timber bottoms. They say the Francis Axe "not only takes the cake, but it walks away with the whole bakery." I have never had one returned as defective, and can conscientiously recommend them.

V. G. FARNHAM.

Akron, Iowa, Feb. 3, 1885.

### "WELL TEMPERED."

FRANCIS AXE CO.:

Your axes have proved excellent this year. They are well tempered, and we recommend them strongly.

Respectfully

G. B. WATROUS.

Waukegan, Ills., Jan. 31, 1885.

Kentucky,

California Redwood.

### "SELLING WITH EXCELLENT SUCCESS."

FRANCIS AXE CO.:

Have been selling your axes with excellent success, and they give good satisfaction to all of our customers.

Very truly,

J. O. STRONG.

Tidioute, Pa., Feb. 7, 1885.

Firemen's,

Wedge.

### "HAVE SOLD FOR SIX YEARS."

FRANCIS AXE CO.:

We have sold the "Francis Axe" for the past six years, and shall sell it as long as the grade is kept up to its present standard.

Yours truly,

E. E. PRUSSIA & CO.

Fort Dodge, Iowa, Feb. 7, 1885.

Maine,

Peeling.

### "GIVEN PERFECT SATISFACTION."

FRANCIS AXE CO.:

Have given the most perfect satisfaction.

Yours truly,

M. J. YOUNG.

Ionia, Mich., Feb. 14, 1885.

### "GIVEN GENERAL SATISFACTION."

FRANCIS AXE CO.:

The "Francis Axe" has given general satisfaction.

SINCLAIR BROS.

Waterloo, Ind., Feb. 7, 1885.



## An Anti-Friction Caster-Wheel.

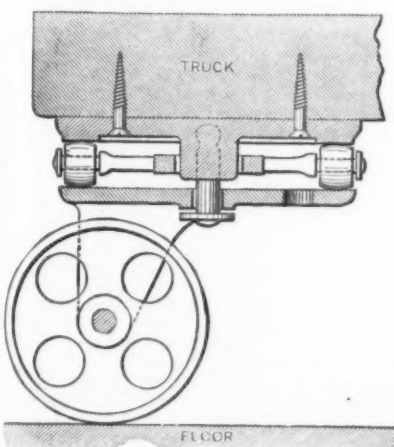
Francis H. Richards, writing in the June number of *Mechanics*, describes a caster-wheel of his own contriving, as follows:

In view of the recent and somewhat remarkable activity displayed in the reproduction with variations of what may be called the anti-friction caster-wheel, it may be of interest to describe briefly a form devised and first made by me about 12 years ago. This caster was more especially designed for heavy trucks in factories and stores, and a few were so used in New York, Connecticut and later in Massachusetts. Two sizes were made, having, as I remember, wheels about 2 and 3½ inches, respectively, in diameter. The plan of construction was suggested by that of the ordinary railway turn-table, from which circumstance it was named a "turn-table caster."

The parts comprised a base having a boss, from which depended a central stud or pivot; a four or six armed spider fitted to turn loosely about the boss and carrying rollers on its arms, which rollers ran on a track formed on the under side of the base; a plate or turn-table pivoted on the central stud below the spider, which plate was provided with arms for carrying the caster-wheel, and an ordinary caster-wheel pivoted in those arms in the usual manner. The base was held to the truck by screws, to which access was had through an opening in the lower plate, opposite to the caster-wheel.

The anti-friction rollers were made of cast iron, about two-fifths the diameter of the caster-wheel, and were held in place by a small washer riveted to the spider-arm. In the small size brass spiders were used; in the larger size they were made of malleable iron. The stud was of wrought iron, cast into the base, and on to that the lower plate was loosely held by a washer fixed by riveting.

To those familiar with this class of manufactures various modifications will readily



Anti-Friction Caster-Wheel.

suggest themselves whereby the principle may be applied to casters for the different uses to which they are applicable.

## Cellini's Method of Casting Bronzes.

In order to cast a bronze statue properly we require a mold made in one piece, with proper inlets for the metal and proper outlets for the air, and a core properly held in the center of the cavity of the mold, says the *English Illustrated Magazine*. If the core were not supported in some way it would touch the walls of the mold and leave at each point of contact no space to be filled by the bronze. The difficulty of pouring a core inside a statue of complicated form so as to leave a space all round between core and mold would seem very great; but when we are told that the space so left must be accurately proportioned to the strength required in that particular part, it would seem a matter of infinite difficulty. It is, in fact, one of the most serious problems an artist can have to solve. There are, however, several ways of forming the core and fixing it in the mold. The simplest is that described by Benvenuto Cellini as having been used by himself when he was called on to cast the figure of the Nymph of Fontainebleau for Francis I. He modeled the figure—a recumbent one about 7 feet long—in high relief, with a background of beasts of the chase, hounds, &c., of a somewhat lower relief, in a poor sandy clay or marl. This work, when finished, was carefully dried, shrinking considerably during the process.

When quite dry he placed it in a kiln and fired it, burned it, in fact, into a terra-cotta; but, as it was made of a poor clay, it would yield only a very soft, porous terra-cotta, and be very friable. This was exactly what he wanted. He then overlaid the whole of the work with an even layer of wax about ½ inch thick, or rather less, which brought it back to the original proportions. The layer of wax was then carefully finished in every respect, and was then covered over to a certain thickness with a mixture of bone-ash and tripoli powder, ground up with a solution of cow-dung and various other ingredients into a smooth paste. This paste, being mixed in certain proportions with ordinary founder's loam, was then laid on in thick layers till the mold had reached the required thickness. The tubes through the walls of the mold, to give ingress to the metal and to afford exit to the air, were made by means of rods of wax which were attached at one end to the wax model, and were built up in the substance of the mold, their unattached ends coming through to the outer surface. When this outer coat or mold was dry Benvenuto put the work into a kiln or oven, and gradually heated it up until the wax inside melted and ran out at the holes left by the melted wax rods. When no more wax would run out he increased the heat of the oven until the mold became red hot. The object of this was twofold: First, to remove by combustion every particle of wax that might have been absorbed by the mold or have been unable to escape through the holes; and, second, to drive off every particle of moisture. This object

having been attained, he melted and poured the bronze into one of the holes, which thus, entering the cavity left by the melted wax, took the form of the latter. The other holes, or, rather, tubes, afforded a ready escape for the air, which, when suddenly compressed by the weight of the metal and expanded by the intense heat, would without such means of exit burst the mold like a bombshell, to the destruction of the work and the imminent danger of all engaged in it.

## A New Reversing-Valve.

Those who appreciate the value of a simple and convenient reversing-valve for steam engines will find a number of interest-

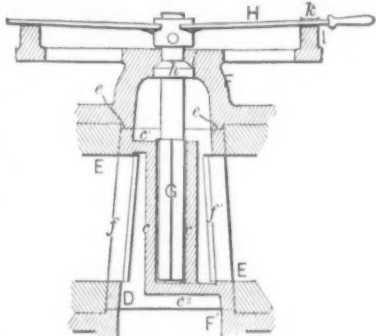


Fig. 1.—Longitudinal Section of Valve.

ing features in the device shown in our annexed engravings, and designed by Mr. E. L. Moore, of Portsmouth, Ohio.

Fig. 2 represents a sectional side view of part of a double-cylinder engine fitted with the valve, and very clearly illustrates its general arrangement and construction. The valve D, as shown, is arranged midway between the two engine cylinders, and is of a slightly conical shape, the taper being just sufficient to provide for its being ground to a good fit. As arranged its longitudinal axis, moreover, occupies a transverse relationship to the axis of the cylinders, but this is simply a matter of choice, and its direction and



Fig. 3.—Transverse Section of Valve.

method of attachment may be varied to suit the requirements of different cases. The valve works within a case, E, directly connecting the two cylinders C C, and forming with its passage a single casting, thus contributing to rigidity and making the whole easily accessible. A central longitudinal partition, c (Fig. 1), divides the valve longitudinally into two compartments, and terminates in opposite end branches c' and c'', which radiate respectively toward opposite sides of the valve case to separate the live steam from the exhaust. The live steam is admitted at the large end of the valve, and serves to hold the latter to its seat, the exhaust, on the other hand, passing off through a pipe, d' (Fig. 2), at the opposite end of the valve case. To prevent the pressure from locking the valve and making it hard to operate, the smaller end is turned to fit against a shouldered portion, e (Fig. 1), of an end cap, F. The longitudinal rib c of the valve is made hollow and of square section, to form a socket which is closed on the steam-inlet end of the valve for the purpose of receiving a correspondingly-shaped spindle, G, by which the valve is operated. This spindle is not secured to the valve, so that whenever it is necessary to remove the latter it may be easily effected by taking off

versa. When required to stop the motion of the engine, the portion of the sides of the valve D between its ports f f are adjusted by the turning of the valve to close communication with the passages g g'. One-half of the bearing surface of the valve D, excepting near and at its ends, may be cut away. The valve is turned to reverse the engine by means of a hand-lever, H, on the spindle G, and by using wide valve ports this lever will not require to travel through the same length of arc as if the ports were narrower. Again, the construction of the

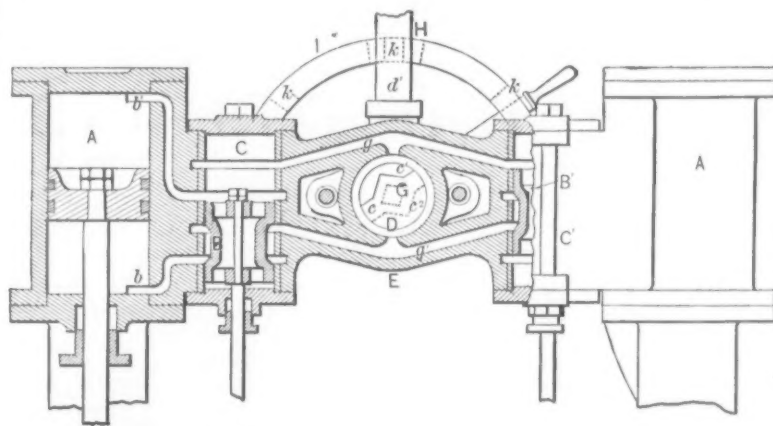


Fig. 2.—Sectional Side View of Double-Cylinder Engine Fitted with Valve.

## AN INGENIOUS REVERSING-VALVE.

valve D is such that it cannot be placed after removal in a wrong position to work.

The valve spindle G has a collar, A (Fig. 1), on its outer end portion, turned and constructed to form a valve, which is held against a seat, i, in the cap F, either by a spiral spring arranged around the spindle, between the end of the valve and the collar, or by substituting for the reversing lever H a spring lever, so that when engaged with any one of a series of three notches, k, in an arc, I, over or against which the lever moves, and with either one of which notches it is engaged accordingly as the valve is reversed or adjusted into a shut-off position, this lever by its tension will operate to hold the valve collar A to its seat. As the valve is subjected to no pressure having a tendency to move it from its set position, the margins of the notches k may be rounded off to facilitate the engagement and disengagement of the lever, and a thin steel reversing lever will suffice, enabling the engine to be controlled from a distance by means of a rope, cord or wire connected with the reversing lever. This will be found especially advantageous when the engine is applied to work an elevator.

The modification shown in Figs. 4 and 5 is designed for single-cylinder engines for cranes, derricks, &c., and shows a valve constructed similarly to the one just described. Fig. 4 is a longitudinal and Fig. 5 a transverse section. The illustrations require no special explanation, being easily understood. The valve, we understand, is being put on the market by Messrs. Moore Bros., of Portsmouth, Ohio, and bids fair to meet with gratifying success.

## Red Lead in Steam-Pipe Joints.

Despite what should be a thorough acquaintance with the subject, owing to familiarity with it, many good mechanics nevertheless have very incorrect ideas with regard to using red lead in steam-pipe joints. The fundamental principle of all joint-making is that the thinner the joint the more durable will it be. With flat-faced joints, as in pipe flanges, cylinder covers, &c., each face must have all the old lead removed, and then wiped over with a piece of oily waste (boiled linseed oil). The lead must be thoroughly worked, either by machine or by hand, to

locomotive practice, nothing but liquid red lead is used; made of red and white lead mixed with boiled oil to the consistency of paint, they are of exceptional durability. Joints between male and female threads, such as screwed pipes and sockets, bolts or studs screwed into boiler plates, &c., in these cases liquid red lead is used, and should be put on the female thread for inside pressure, and on the male for outside pressure, as then the steam in each case forces any surplus lead into the thread, and forms a more reliable joint, or rather assists it; whereas,

when it is applied in the reverse way, as generally done, the threads are left quite bare and clear, leaving nothing to assist the joint. These methods, broadly speaking, apply just the same to the various compositions sold as substitutes for lead, the chief advantages claimed for them being cheapness and durability; but they can never

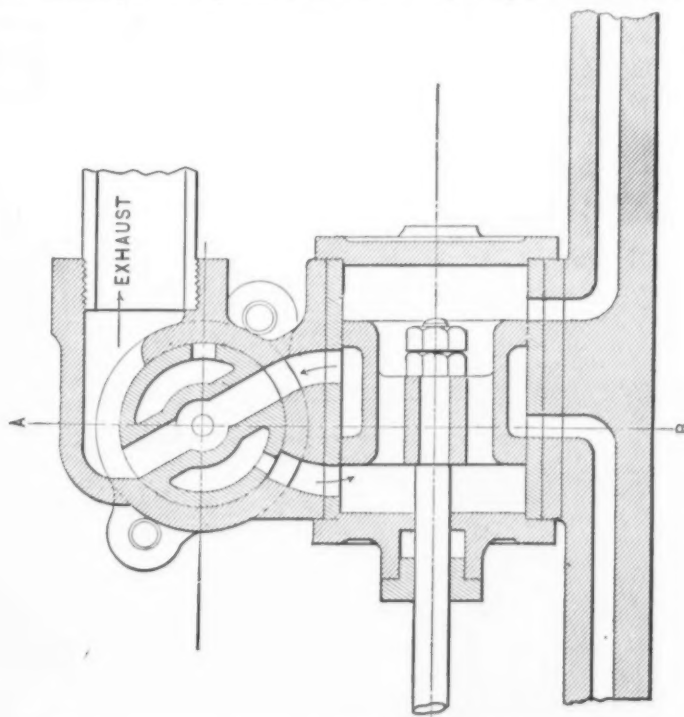


Fig. 5.—Transverse Section of Valve for Single-Cylinder Engines.

surpass it, nor even equal it, if it be only used as explained, especially if a little common sense be applied in special cases.

## The Position of the Consumer in Strikes.

In the course of an editorial discussion of that wide subject, strikes, the *Engineer* takes the following ground:

The new feature of the question, namely, that strikes are now not only virtually, but ostensibly, directed against the consumer, and not against the capitalist or employer, has not yet received the attention it deserves. It is an aspect of strikes which was not, a few years ago at least, contemplated by any political economist; and, as we have said, it is encouraging, because it shows that the working man can change his ground and shift his basis of operations. In other words, it proves that his mind is open to conviction even on trade questions; and it may not be impossible to prove to the next generation, if not to this, that strikes are a most defective means of attempting to secure a given end. We are not going to dispute the right of a man, or a body of men, to strike. We do not assert that it is not a tempting expedient. We will even admit that strikes have now done the workingman some service, but we do assert that strikes cannot be divested of a great defect, which is that they are enormously expensive. They represent an intolerable outlay, and it is a disgrace to a civilized community that a cheaper and better method of determining what is the proper price to pay for a day's work cannot be devised. It would, we think, soon be devised if only the workingman could be taught the whole truth; and we end this article, as we began it, with an exhortation to employers, in season and out of season, to work at the extension of education, so that men may see that trades-union leaders are not invariably infallible, and that, however possible it may be to crush a capitalist, no power on earth exists which will crush the consumer. The capitalist may be ground between the workingman and the consumer like wheat between the upper and nether millstones, but the consumer is certain to win in the end, and the only victory which the workingman will achieve must be won in the character of a consumer.

The driving-wheels of the first locomotive engine built in this State, and the third one constructed in America, have been sent from the shops in Albany to the Grand Central

depot in New York, for preservation as a relic. On the hub of each in yellow letters is "De Witt Clinton, first trip, August 9, 1831." Each weighs 350 pounds. In diameter they are about 5 feet. From a solid hub in the center, spokes less than an inch in diameter are set, similar to those in a wagon-wheel, but further apart, and extend to a fellow ½ inch thick and 3 inches wide. On the outer edge is a series of holes which originally held a steel flange in place. The workmanship is crude compared with that of to-day. The driving-wheels now turned out at West Albany weigh 1000 pounds each, without the tire, or more than five times as much as the wheels of the Clinton, which was the first engine that made a trip in this country, both of its predecessors breaking down. The engine was kept as a relic in the repair shops at West Albany until 10 or 12 years since, when it was broken up and the copper and brass sold to locomotive works.

## New Iron Lighthouses.

For three months workmen at the Colwell Iron Works have been casting plates for the huge shell of the iron light tower for the Delaware Breakwater, of Delaware Bay. The structure towers from the floor through the roof like the frustum of a cone, having a circumference at the base of 66 feet and 54 feet at the top, which will rise about 80 feet above water. This form of light tower represents the latest phase in structures of its kind. It has been recently adopted by the United States Lighthouse Board, and from this time on dozens of its kind will be constructed. The cost is trifling compared with the old structures of masonry, and only three or four months' time is required in building. The Colwell tower is to be placed on one of the most exposed points of the coast. The specifications therefore called for the most skillful workmanship. About 150 huge cast-iron plates comprising it have been carefully tested by Government engineers. The entire tower has been put together in the foundry, and

will soon be placed on strong concrete foundations provided for it. The construction comprises four courses or section-rooms, the first of 15 and the others of 16 plates each, of ¾ inch thickness. These are bolted together on the inside by means of flanges, and are so placed that the plates of one course break joints with those of others. This tower is surmounted by a circular watch-room made of nine plates, and this by an octagonal lantern, capped by a copper ventilating ball, through which is run a brass pinnacle tipped with platinum. The floors of the sections are composed of radiating plates supported by a cast-iron column 3 feet in circumference. The five floors are accessible by stairways, and two galleries surround the watch-room and lantern. All lighthouses will hereafter be made in some foundry, taken apart for shipment after inspection, and put up again on their foundations. Those standing directly in the water will be made of wrought iron and others of cast iron. The shells have brick interlined and receive their lenses from France. Lenses are not yet made in this country, and Fresnel, of France, has an undisputed key to the Treasury at Washington.

L. Chapman, of Collinsville, Conn., has patented a process of recutting worn and soiled files. The files are first cleaned with a wire brush and placed in a solution of hot water and sal soda to remove the oil. They are then dried in sawdust and immersed in a saturated solution of blue vitriol and copperas, until they present the appearance of a copper surface. From this bath the files are placed in a bath of diluted sulphuric acid, and are allowed to remain therein until their surface looks black. The working of this bath may be hastened by warming it. On taking the files from the acid bath they are dipped in weak limewater, and are again dried in sawdust. After the sawdust has been brushed off and the files have been properly oiled they are ready for use.

A stack has been recently completed for a lead-smelting works at Pueblo, Cal., which is 310 feet in height and 10 feet in diameter in the clear from the foundation up. It rests on 16 feet of smelter slag, which was poured in a liquid state in the ground 16 feet deep, and allowed to cool and solidify. On top of this, and above ground, is a second foundation, 16 feet high, made of brick. The stack proper, which is 287 feet high, is made of iron and lined with fire-brick. It is the largest stack west of the Missouri River, and when completed was painted red.

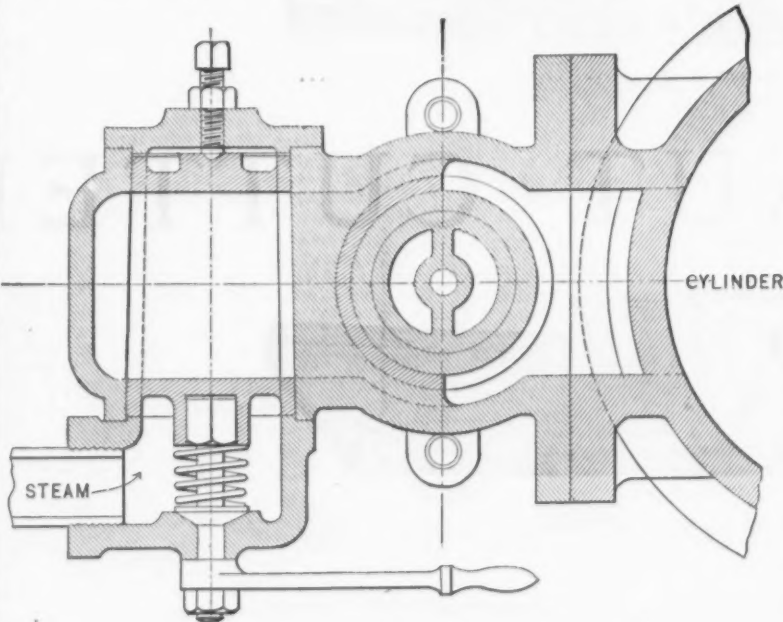


Fig. 4.—Longitudinal Section of Valve.

a cap, F', on the larger end of the valve case.

The sides of the valve have opposite parts f f', more clearly shown in Fig. 3. These may be of any desired width. One of them serves to pass steam to and the other to exhaust steam from the engine-cylinder valves by means of passages g g', and connecting with the cylinders C C either passage g or g', one serving for passage of live and the other for exhaust steam, according as the reversing-valve is turned. Thus the steam passage g or g' for the live steam from one direction in the motion of the engine becomes the exhaust passage in an opposite-moving direction of the engine, and vice

make it soft and pliable, and also to remove all grit and lumps. It should then be rolled in the hands into thin ropes, about ¼ inch diameter, and laid on once round inside the bolt-holes. The two faces must now be brought together carefully and tightened up equally all round by screwing up opposite bolts, so as to avoid getting one side closer than the other. Tar twine, hemp, string, wire gauze, &c., should be studiously avoided wherever possible, as it prevents the faces from being brought into close contact. There are certain rough jobs where it may be permitted, but a joint so made is never so durable, and is very clumsy. When joints are accurately faced by scraping or otherwise, as in



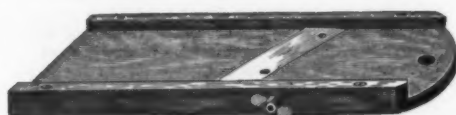
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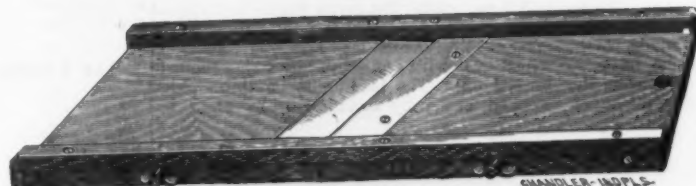
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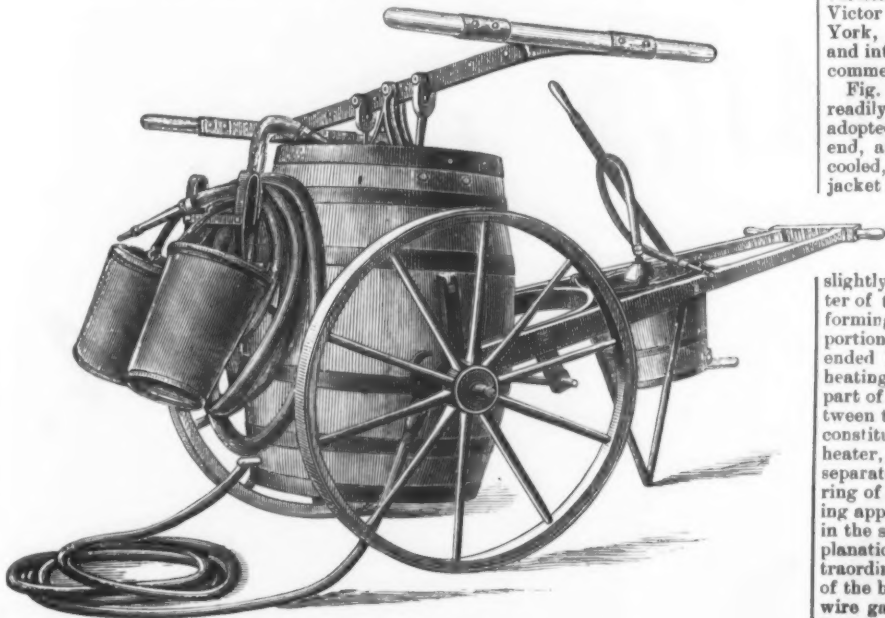
 WRITE FOR PRICE LIST AND DISCOUNT.



**Morrell's Barrel Fire Engine.**

The New York Plow Company, 55 Beekman street, New York, are offering to the trade Morrell's barrel fire engine, a general view of which is shown in the annexed cut. The reservoir is simply an ordinary kerosene barrel, to the sides of which are fastened trunnions. The bearings of the truck are so arranged that when the barrel is resting on the ground they may be brought under the trunnions by raising the handle of the truck. The handle being pressed

Supreme Court of Iowa, where the judgment against him was reversed. Judge Adams, in the opinion, said: "The instruction was erroneous. A general warranty does not usually extend to defects known to the buyer. Some of the authorities speak of the defects which are not covered by a warranty as those which are patent or obvious. The doctrine seems to be that the warranty as to such defect is waived. The court may presume, ordinarily, that that was the understanding. But we cannot think that the purchaser who has bought with a warranty



MORRELL'S BARREL FIRE ENGINE.

down raises the barrel from the ground so that it can be transported. A rope attachable to the truck is provided with the engine for hauling it about in case of fire. The pump consists of two 4-inch submerged cylinders, securely fastened within the barrel, and worked by a double brake or lever, pivoted to an adjustable fulcrum, bolted on top of the barrel. It is claimed for this engine that with four men at the brakes it will throw a  $\frac{1}{2}$ -inch solid stream of water 75 feet and a spray stream nearly 100 feet. When employed for fire use it is recommended that a number of barrels be fitted with trunnions which may be used for carrying water to supply the pump. The truck can be used as a dumping hand-cart by substituting an adjustable box for the barrel, the boxes being provided by the manufacturers, who also supply other extra fittings. In the cut, a bucket force pump is shown hung to the truck handle, which, though not part of the engine, is useful in the case of incipient fires, as well as for various domestic purposes. The engine is described as built in a substantial manner, the pump having solid ball valves with metallic cradles to limit their action. Though intended principally for a fire engine in country towns and isolated houses, the utility of the engine in agricultural work for spraying trees and watering gardens is also alluded to.

**LATEST LEGAL DECISIONS.****INSOLVENT DISCHARGE—NON-RESIDENT CREDITOR.**

The holder of a promissory note, a citizen of Alabama, sued the maker in California, and he set up his discharge under State insolvency proceedings in bar of the action, upon which he had judgment. The plaintiff appealed the case—*Rhodes vs. Borden*—to the Supreme Court of California, where the judgment was reversed. Judge McKinstry, in the opinion, said: "In 1812 the Supreme Court of New York decided that a discharge under the insolvent laws of that State was a bar to a suit brought in the New York courts on a contract, wherever made; and in 1816 the Supreme Court of Massachusetts decided that a discharge under the bankrupt law of a State where the contract was made, and of which the debtor was a citizen, was a good bar to an action upon the contract in another State where the creditor resided. But the Supreme Court of the United States in 1840, in 1857 and in 1863 decided that such a defense was not valid. In the last year it said: 'Insolvent laws of one State cannot discharge the contracts of citizens of other States, because they have no extra-territorial operation, and, consequently, the tribunal sitting under them, unless in cases where a citizen of such other State voluntarily becomes a party to the proceedings, has no jurisdiction in the case. Legal notice cannot be given, and, consequently, there can be no obligation to appear, and, of course, there can be no legal default.' We are of this opinion that we should adopt and enforce this decision of the Federal Court."

**SALE—WARRANTY—INSPECTION.**

P. bought from M. a kiln of bricks, and in a suit on P.'s note for the price he set up the defense of breach of warranty as to a portion of the bricks. On the trial the evidence showed that M. expressly warranted the brick "to be good brick and all right," but that on opening the kiln, which contained 45,000 to 50,000 brick, about 10,000 were worthless. It was shown P. saw the exterior of the kiln, and that the outside appeared to be good, but that upon the removal of a portion of them there was revealed "a cold spot," where the brick had not been perfectly burned; that this "cold spot" or defective part of the kiln could have been discovered by the purchaser if he had gone upon the top, but that the top was covered with three thicknesses of boards and some bricks and other things. He did not go up, and the court instructed the jury against him, saying: "If, by the exercise of ordinary care at the time of the purchase, P. might have discovered and known the character, quality and number of the brick in the kiln, and failed to do so, he cannot maintain his defense on the warranty." The defendant carried the case—*Meckley vs. Parsons*—to the

**The "Victor" Caloric Engine.**

The annexed engravings represent a new vertical hot-air engine brought out by the Victor Caloric Engine Company, of New York, and embodying a number of novel and interesting features which will no doubt commend themselves favorably.

Fig. 2 shows a longitudinal section, and readily explains the general arrangement adopted. The engine cylinder is open at one end, and the part nearer the open end is cooled, preferably, by means of a water-jacket surrounding it. The part nearer the closed end is made of larger internal diameter, and is lined internally with asbestos. The internal diameter of this lining is equal to or slightly larger than the internal diameter of the cooled part of the cylinder, thus forming a continuation of it. The lined portion of the cylinder is closed by an egg-ended heater, as shown, presenting a large heating surface and extending into the lined part of the cylinder, but leaving a space between the heater and the lining. This space constitutes part of the heating chamber. The heater, which is made of cast iron, is formed separately and is bolted to the cylinder, a ring of asbestos being interposed. The heating apparatus proper is very clearly shown in the sectional view and requires little explanation. It is, in fact, nothing but an extraordinarily large Bunsen burner, the top of the burner being furnished with a cap of wire gauze. The air inlet, as will be seen, is very large, and the whole fixture can be easily taken out and replaced as occasion may require. The working piston operates in the cooled end of the cylinder, and a displacer piston combined with a moving regenerator also works partially within the cooled end and partially within the lined portion. The working piston is made of considerable length and is supplied with steel packing rings. In the hollow portion of the piston are formed

heating chamber, without, however, touching it, leaving a small space between. This sheet-metal cylinder is carried to such a length that when the combined displacer and regenerator is at the extremity of its inward stroke it will be interposed between the non-conducting lining of the heated chamber and the egg-ended heater, leaving an annular shaped passage on either side of the thin metal. A cap of cast iron is attached within the thin-metal cylinder in such a position that when the displacer is at the end of its inward stroke the cap nearly touches the egg-ended part of the heater. Holes are formed in the sheet-metal cylinder of the displacer near the part where the cap is attached. The cap, as shown in the engraving, is formed so that it follows the form of the heater. Webs are cast on the cap to support a cylinder of some non-conducting material which extends to or nearly to the upper cap already described. Within this cylinder is placed the regenerator, consisting of wire gauze.

The action of the engine is as follows: The air within the heated chamber is heated, and the expansion drives the working piston outward. This actuates the crank shaft, and rather before the working piston has reached the outer extremity of its stroke the crank-shaft causes the combined displacer and regenerator to commence its travel from the cool portion of the cylinder to the heated chamber. The air from the heated end of the chamber passes between the sides of the heater and the inner sides of the lower portion of the thin-metal cylinder forming part of the displacer, then passes up part way along between the outer side of the thin-metal cylinder and the inner side of the non-conductor of the heated chamber, then through

of the thin-metal cylindrical portion of the displacer and the heater, and is thus heated, the consequent expansion of the air forcing the working piston outward. The crank actuating the displacer is set so as to move the displacer in advance of the working piston.

As shown in the perspective view, the engine is controlled by a governor and is furthermore supplied with an ingenious device enabling the engine to be stopped almost instantly if required. This device consists of a small valve, by means of which communication may be established between the outer air and the interior of the engine cylinder, and the pressure thus be released, stopping the engine after a few turns. The value and convenience of this feature will be readily appreciated. The engine, we believe, is the only vertical double-crank caloric engine now on the market, and in point of convenience, compactness and general efficiency seems to compare very favorably with other types. As shown in Fig. 1 it is arranged to work a pump, and the results which have been obtained with it in pumping water have been of a most satisfactory character. Thus it is claimed for it that with a 6-inch cylinder it will pump 275 gallons per hour to a height of 50 feet. Mr. John Q. Maynard, 12 Cortlandt street, New York, is the agent.

A shaft-straightening machine in which the rests for the rod are wholly independent from the bed that supports the press has been patented by W. J. Muncaster, of Cumberland, Md. The rest consists of a sliding and of a stationary block, each carrying supporting rollers. After the shaft has been placed on the rollers the latter are caused to advance, so



Fig. 1.—Perspective View.

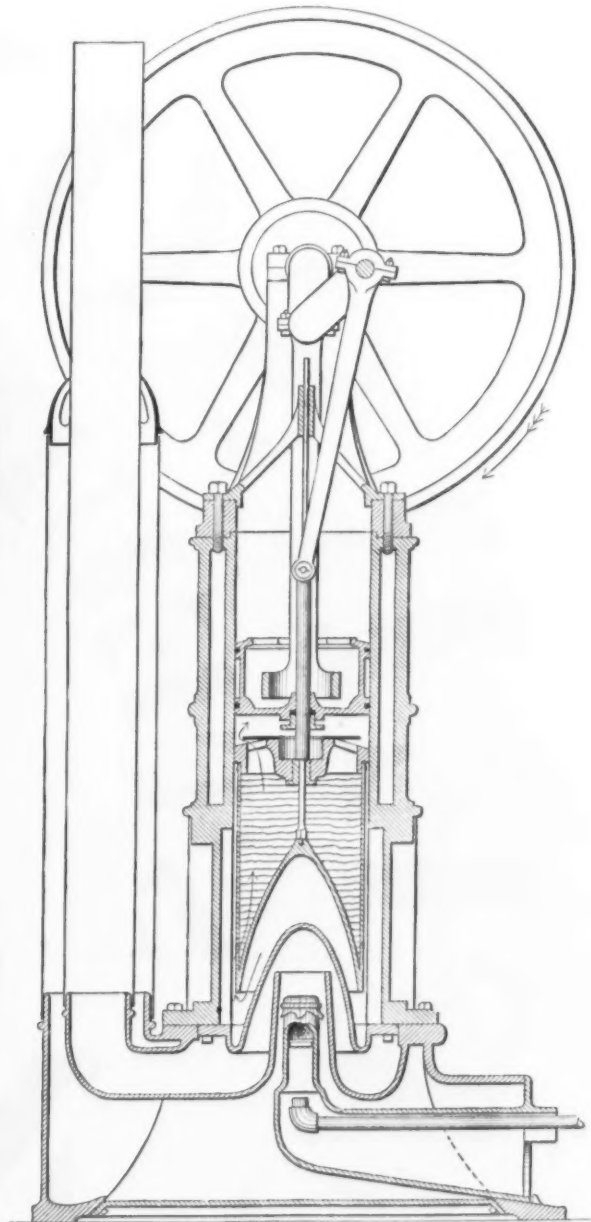


Fig. 2.—Longitudinal Section.

**THE "VICTOR" CALORIC ENGINE.**

two bosses, projecting inward. The piston itself is connected to the crank-shaft by means of a connecting-rod, the lower end of which is formed as a ring with two bosses. These bosses fit between the two bosses on the piston. The connecting-rod is continued from one side of the piston. A pin on each side is fitted through each of the bosses on the piston, into each of the bosses on the ring of the connecting-rod, so that the latter

the holes through the thin-metal cylinder, near to the inner cap of the displacer, to the regenerator contained within the displacer. The air then passes through the regenerator, giving up a portion of its heat to the regenerator, and passes out considerably cooled through the holes or openings in the outer cap of the displacer. The air rushes through these holes against the cooled sides of the working cylinder and is

as to raise the shaft clear of the support of the press. As the rollers are rotated by worm gear the shaft rotates with them and the high portions are chalked. The carriage press is moved to the required point, and is clamped in position. The rollers are thrown apart, and the shaft is let down and caused to rest upon the supports of the carriage. The press is then put into gear by a shifting rod, and a heavy screw stem is set up or down as required for the special work to be done. After one place is thus acted upon the shaft is raised, the press moved to the next point and the several operations are repeated until the work is completed.

A new method of forging or rolling metal bars has been patented by G. F. Simonds, of Fitchburg, Mass. The invention has reference to the use of platens having die faces which are reciprocated over the surfaces of metal articles, to give them any predetermined shape or size, dependent upon the configuration of the die faces. The platens are constructed with a view of reducing their length and of necessitating but a short travel to accomplish the desired result. To this effect each platen is provided with three raised forming surfaces, each composed of three intersecting converging planes. By this construction three devices are obtained, which simultaneously commence work at two or more points and which continue the work so as to spread the metal from four points outward until the operation is completed. Two of the working faces spread the metal from the center, while two start it from the ends.



Rouse's Driven Well Point.

inch in diameter. From this it appears that the capacity of his point is three to one greater than some others in use of the same length.

A hot-air feeder for furnaces has been invented by J. C. Loveridge, of Jersey City, N. J. The upper and forward end of the bridge wall is formed of a perforated pipe set into the wall, and projecting somewhat forward beyond its front face. This pipe is made with its upper and lower sides flat and parallel, while its rear side is perpendicular. The front of the pipe is rounded and is provided with a number of small holes, extending through the internal bore. One end of the pipe at one side of the bridge wall is stopped by a plug, while its other end is carried through the side wall of the furnace and communicates with the atmosphere.

is free to oscillate. The other end of the connecting-rod is attached to one crank of a two-throw crank-shaft. The two cranks are set 90° apart. The displacer-rod, which is brought through a small gland in the working piston, is attached to its crank by means of the displacer connecting-rod. The whole connecting gear is compact and direct.

As regards the combined displacer and regenerator, it should be remarked that a small cap forms the end furthest away from the heater, and is attached to the displacer-rod. This small cap operates within the working cylinder, and is supplied with orifices permitting the passage of air from the regenerator to the cylinder. A cylinder of thin sheet metal is attached to the cap, and is of such a diameter that it works near the non-conducting lining of the

further cooled. The consequent contraction reduces the pressure in the cylinder and allows the working piston to descend, continuing the motion of the crank-shaft, and rather before the working piston has reached the extremity of its inward stroke causes the displacer to commence its outward stroke. This causes the cool air to rush through the holes in the outer cap of the combined displacer and regenerator into and through the regenerator. Part of the heat previously left in the regenerator is now taken up by the air in its passage, and the air which is thus partially heated passes over the inner cap and is further heated, then passes out through the holes in the thin-metal cylinder of the displacer, and flows between the outer sides of the thin-metal cylinder and non-conductor of the heated chamber. The air then passes between the inner sides



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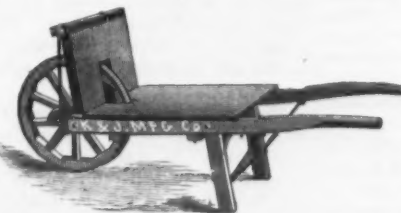
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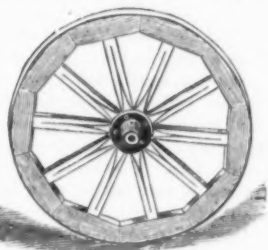


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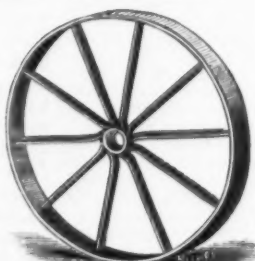
It has *TEN* spokes of thoroughly seasoned wood, and each spoke is supplied with a separate felloe. The hub is of chill cast iron, and riveted firmly to the spokes, which are so cut as to counterbrace each other. The spokes are keyed from the center after the tire is shrunk on. *This wheel will not shrink or give in any weather or climate, and the tire cannot become loosened.* An oil hole is drilled into the hollow washer of the hub, and the oil distributes itself along the bearings while the wheel is in motion. The wheel revolves on a fixed shaft or axle, which passes through the end of the handle, and is a brace to the barrow. This wheel cannot be broken or weakened by ordinary usage, and will last a lifetime. It is well painted. *We guarantee it superior to any other WOOD WHEEL.*

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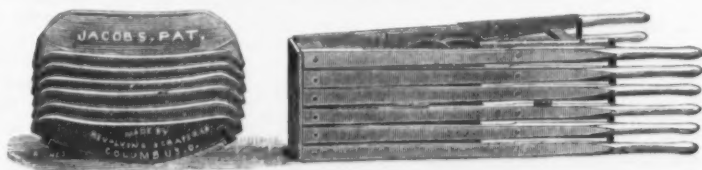
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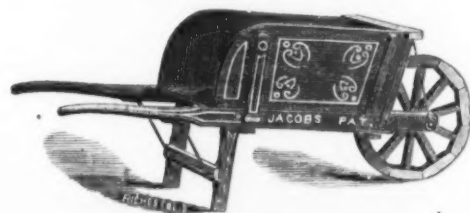
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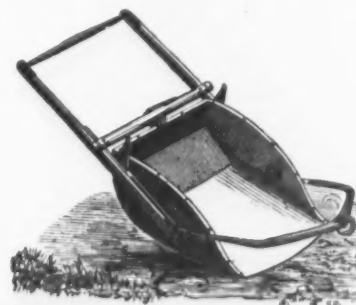
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AND  
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## DAVID WILLIAMS, Publisher.

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## The Financial Crisis in Mexico.

In an editorial in January last on "Mexican Indebtedness" we showed the precarious condition of the national finances in Mexico. Since then the embarrassment of the Government has become such that on June 23 the President issued a decree to the effect that all taxes now in force shall be paid in cash or notes of the National Bank of Mexico, custom-house certificates to be no longer receivable. For the purpose of retiring from circulation notes and bills constituting the floating debt, and to cover pending obligations, the Federal Treasury will issue Treasury bonds of the value of \$25,000,000 at 6 per cent. interest, payable in 25 years. Provision is made for the emission of suitable bonds with 52 semi annual coupons. These bonds are to be made payable to bearer. The National Bank of Mexico is to undertake payment of the interest on the new bonds and their redemption, the commission to be paid the bank to be arranged hereafter.

Simultaneously, in a special report on the financial situation, the Minister of Finance states that the pecuniary embarrassments of the Government have been occupying the attention of the President since taking his seat, and that he has found that the public revenues, burdened as they are with charges of all kinds, were not sufficient to meet with regularity and exactness the expenses of the different departments of Government. The Government has been unwilling to increase taxes or to reduce expenses to the detriment of the public service, and therefore has finally decided on temporary measures, meanwhile continuing to seek a satisfactory solution of the financial problem. It has been seen by the President that the probable income of the ensuing fiscal year would not meet the expenses fixed by the recent budget, and in order to equitably apportion the necessary retrenchment salaries of over \$500 per annum are to be subjected to discounts: On salaries of from \$500 to \$1000, 10 per cent.; on salaries of from \$1000 to \$2000, 15 per cent.; on salaries of from \$2000 to \$6000, 20 per cent.; on salaries of from \$6000 to \$15,000, 25 per cent.; on salaries over \$15,000, 50 per cent. Each official whose salary is reduced receives from

the Treasury a certificate of indebtedness covering the percentage taken off. The military in active service are now paid for only 25 days in the month, and will not have to suffer a further reduction. The military not in active service will be paid with the same discount as civil employees. No money is to be spent on new public works, except for repairs. Double salaries, except in a few cases, are abolished.

The revenues of the next fiscal year, July 1, 1885, to June 30, 1886, from customs and taxes, under the most favorable circumstances, are estimated not to exceed \$30,000,000. From that sum must be deducted, however, 30 per cent. of all the receipts from customs pledged beforehand, as follows: 15 per cent. to the National Bank of Mexico to secure the interest on loans, 7 per cent. for the payment of railroad subsidies, 3 per cent. for harbor improvements, and 5 per cent. for the payment of maturing debts. Assuming that the custom houses collect \$16,000,000, there will have to be deducted from the estimated revenue \$4,800,000, leaving it \$25,200,000, yet the committee of the budget recommended, and Congress, whose second session came to a close on the 31st of May last, voted, appropriations to the different departments of the Government, amounting to no less than \$34,000,000.

The remedy which the Government has resorted to of an issue of interest-bearing bonds and reducing salaries was, under the circumstances, about the only one that was left short of an issue of irredeemable paper money; it was a forced loan to ease the Treasury, but does not seem ample or radical enough to enable the Government to meet its engagements during the fiscal year 1885-86. Paper money is unpopular in Mexico, and no Government has yet dared to issue a dollar of it; yet we do not see how it can be avoided, the Mexican Republic enjoying no credit either at home or abroad. Mexico owes, without paying interest for many years past, \$101,017,447 in Europe, besides \$1,875,123 to the United States under the convention of July 4, 1868, and has a domestic debt of \$40,241,215.

What interests American capitalists most is the payment of railroad subsidies, which, it is feared, may be suspended for a while. In the Boston stock market there was quite a panic on June 23 last when a sudden fall took place in Mexican Central 7 per cent. bonds and stock. On that day the bonds opened at 51½ and sold down to 45½, and the stock gave way from 12 to 10; three days later the former declined to 37½, and the latter to 7. The indebtedness of the company on January 1, 1885, exceeded \$50,000,000; the net earnings last year were only \$530,897 of our money. With regard to suspension of subsidies to American built railroads, the lawyers seem to be of opinion that, being Mexican corporations, though the capital may be American, our Government will be powerless in the matter. Respecting the National Bank, a press dispatch dated Mexico, June 24, reads as follows:

There was a protracted meeting to-day of the directors of the National Bank of Mexico, at which Senator Dublan, the Minister of Finance, was present and interrogated as to whether any arrangement could be made with the Government whereby the bank might be exempted from the operations of the law decreed on Monday last, a synopsis of which has been telegraphed in these dispatches. The Minister of Finance replied that nothing could be done, as the law had been decreed by the full Cabinet, presided over by the President of the Republic. The National Bank is badly embarrassed, and it is predicted cannot survive this shock. The London Bank is quite unaffected by the law. There is talk that the National Bank, the Central Railroad and the National Railroad will join in a common protest to the Government, but not until their attorneys meet can it be decided upon what grounds this can be accomplished. The National Bank capital is largely held in France, where it is backed by the Franco-Egyptian Bank, and to-day rumors have been current that the French Government might make a diplomatic protest in behalf of the bank.

The experience which the Second Empire made at the time of its intervention in favor of the Yecker bondholders is too fresh in the memory of Frenchmen to admit of the probability of French interference in any shape. It is fortunate for Mexico that Porfirio Diaz, whose honesty and patriotism nobody doubts, chances to be at the helm of Government in the present crisis. Severe as it may be, he will not likely be able to overcome it, and, if need be, by resorting to the issue of paper money. He is about the only man in Mexico who could resort to this unpopular measure with any chance of success.

An event of some significance in the history of mining in this country is the striking of the Calumet and Hecla conglomerate vein in the Tamarack shaft. The persistency of the great ore shute in the latter copper mine led a number of gentlemen, the majority of whom are identified with the Quincy management, to acquire property in the hanging country of the vein, and begin the sinking of a vertical shaft, which it was known would have to be more than 2000 feet deep before the goal was reached. With power drills and modern explosives work has progressed with unprecedented speed, and on the 21th the great vein was struck at a depth of 2260 feet. In order to reach the principal part of the ore-bearing ground controlled by the company the shaft will have to go down considerably deeper. The expenditure must have been a very heavy one, and yet, even at present prices of copper, it will be soon recovered, provided the vein is found to be as productive as it has been in higher levels in the Calumet and Hecla. The latter company have gone down on the dip of the vein fully 3500 feet, and have found

the deposit persistently copper-bearing. Barring accidents by faults or squeezers, which are unlikely, the Tamarack will have a brilliant future before it, a just reward for pluck and enterprise.

## Standard Rail Patterns.

For years the proceedings of such bodies of railroad men as the Master Car Builders' Association have been occupied in discussing and settling upon standards for a variety of purposes. They have carefully worked out a standard axle, and only lately have put forward a standard freight-car truck. We have no doubt that these efforts have been very well directed and will lead to the saving of heavy amounts of money annually to the railroads. The interchange of cars has, we presume, had a good deal to do with forcing the master car builders to take the steps in the direction alluded to, and it is surprising that their good example has not been followed by those who decide what is to be the section and weight of rail to be put down. They certainly cannot plead that the importance of the subject has not been fully and eloquently presented. As early as 1881 the late Alexander L. Holley took it up in his characteristically thorough way in a paper presented to the American Institute of Mining Engineers, and it is only lately that Capt. W. R. Jones, of the Edgar Thomson Steel Works, has again broached it before the Engineers' Society of Western Pennsylvania. Paraphrasing after Holley, it is almost appalling that the mind of man can hit perfect in designing a rail within the 64th of an inch, and yet that is just the position which railroad superintendents have reached. It is only recently that we heard of a case where a client of a steel works insisted upon his own section, in spite of the fact that he was offered a rail of the same weight and of dimensions so closely identical with those of his own pet design that, placed one above the other, the eye could not detect any differences.

From the producers' point of view the matter is a very serious one. Mr. Holley, five years since, stated that there were then 119 current rail patterns, there being 30 alone for the 60-pound section, and it is certain that their number has since been considerably added to. This multiplicity of sections means a very heavy expenditure for the manufacture and maintenance of rolls, a set for one section costing fully \$1000, and it makes it impossible to carry any stock of rails. It often involves rough rails, too, as Captain Hunt has pointed out. Altogether the lack of system now in vogue is very harmful, not alone to the rail mills, but to the railroads, who must, of course, ultimately pay for the extra outlay occasioned.

It is useless to deny that there is a personal element affecting this question which should be eliminated. Every one will respect honest differences of opinion concerning the distribution of metal in a rail, but a sharp rebuke should reward those railroad engineers who cannot resist the temptation of petty vanity in seeing their name coupled with a new section. Unfortunately, this one means to distinction and glory appears to have exceptional attraction to the average railroad superintendent. We do not know how far this feeling may account for the indifference or opposition with which attempts at reform are received, but we do not doubt from many indications of the peculiar spirit we allude to that it is more potent than is generally believed. Mr. Holley proposed standard sections and failed. Captain Jones has the courage to come forward, and it is the interest of railroads and rail mills alike that he should not share the fate of his predecessor. One of the reasons why there has been so little success, seems to be that the reformers have not, with all due respect for the two societies named, gone before the right tribunal. If those who ultimately decide what the rail patterns on the railroads are to be were members of an association similar in character to the Master Car Builders', a discussion and a well directed agitation might soon settle the matter. If the railroad engineers could be got together for an interchange of opinion and for the presentation of a standard section, or the adoption of one already proposed, this vexed question would be set at rest, and a large sum of money would be annually saved to producers and consumers.

Some weeks since we printed an estimate by Messrs. Henry Merton & Co. on the production of spelter in the world. Since then another series of figures has come to hand, covering the same ground, emanating from the statistician of the association of the Aix-la-Chapelle district, the unit being the metric ton:

	1884.	1883.
Rhenish Provinces and Westphalia	37,461	36,088
Silesia	76,338	71,466
Belgium	40,449	38,095
Altenberg Company in Belgium, Germany and France	82,532	50,015
Société Asturienne in Spain and France	15,574	14,808
England	39,259	38,061
Austria	4,000	4,540
Poland	4,297	3,729
Total Europe	259,740	247,497
United States	94,978	83,429
Grand total	294,716	280,926

Messrs. Merton & Co.'s figures, 251,977 metric tons in 1884, and 248,399 metric tons in 1883, it will be observed, differ little from those quoted. The low values of spelter all over the world are fully explained by the growth in the production in the face of a decline in the consumption. Silesia is particularly aggressive in this respect.

## Automatic Couplers.

The Legislatures of New York, Massachusetts and several other States have recently passed statutes making compulsory the adoption of improved methods of car-coupling in place of the old link-and-pin arrangement. The provision in New York is that "after July 1, 1886, no couplers shall be placed upon any new freight car to be built or purchased for use, in whole or in part, upon any steam railroad in this State, unless the same can be coupled or uncoupled automatically, without the necessity of having a person guide the link, lift the pin by hand, or go between the ends of the cars." The necessity which prompted this legislation arose from the frightfully large number of accidents, many of them causing death or permanent injury, occurring every year, and directly traceable to the present methods of coupling. For illustration, in Massachusetts during the year 1881 there were 200 employees reported killed or injured on the various railroads of the State, of which 59 owed their injuries to this cause; in 1882, out of 198 cases, 60 were caused in this way; in 1883, out of 265 cases, 86; in 1884, out of 182, 68. In New York there were reported for the year ending September 30, 1884, 17 employees killed and 386 injured while engaged in coupling cars. It was apparent that if anything could be done to remedy this evil it should receive the sanction and support of legislation. But there were and still are many practical difficulties in the way of any enforceable regulations on this subject. There is a great difference in the couplers and draw-bars, and frequently in the height of the freight cars, belonging to different companies organized under the laws of the different States, though this last difference has been greatly reduced since the convention of car builders held in 1870.

The railroad cars of one line or State are constantly meeting, and must necessarily be coupled with cars of another State. It is stated on the best authority that the number of freight cars from other States on the railroads of Massachusetts at any given time is in excess of domestic freight cars, and over 10,000 domestic freight cars are constantly scattered over other States. Now, the legislation of Massachusetts or any State cannot possibly extend beyond its own territorial limits, and in making any coupling device obligatory upon its own roads it cannot expect that all the roads of other States will voluntarily conform with the standard prescribed by that State. It is true that foreign cars without the standard coupler could be excluded from the railroads of the State by legislation, but any such legislation would produce great confusion in the handling of freight, and be in the last degree detrimental to the business interests of the State. It would amount to a prohibition of through freight. The free exchange of cars is an absolute necessity, and cannot be hindered or restricted without producing irreparable loss. It is, of course, possible for Congress, under the Constitutional provision giving it power to regulate commerce between the States, to prescribe a device which would be uniform and compulsory in all the States and Territories. Such action has been strongly advocated, but the better opinion is that all possible benefits can be obtained through the harmonious action of the various State Legislatures. It is not desirable to unnecessarily extend the field of Federal legislation.

In consequence, therefore, of the impossibility of excluding from the State freight cars having the link-and-pin coupler, it is necessary that the standard coupler adopted shall be so constructed as to be capable of use in connection with the link and pin. These standard couplers must be, of course, automatic, or at least so devised that it will not be necessary for the brakeman to go between the ends of the cars. Many of the devices are extremely ingenious and practicable in themselves, but it is not enough that the coupler is excellent in itself. It must be readily adjustable to other and inferior mechanisms. The very best coupler that can be invented must, if lacking adjustability, wait until the transition period is bridged over and it is possible to adopt a uniform system for all the States. Under the Massachusetts statute of 1884 the commissioners were directed to examine and test automatic safety couplers with the view of ascertaining the merits and defects of each, and to prescribe those for use which they found best fitted to serve the purpose under present circumstances. In accordance with this direction a hearing was had at Boston before the commissioners and representatives of the railroad commissions of Ohio, Iowa and Michigan. Over 200 entries and applications were made, a number comparatively small, for up to the date of the hearing, last September, the patents issued for freight couplers amounted to 2950. What the board desired was practical information to enable it to fulfill the duties imposed upon it. It refused to order the use of any coupler which had not been tested in actual traffic, on the ground that no expert can judge of the practical working of a device merely from the examination of the model. The selection was governed by the idea of choosing such forms of couplers as would secure to railroad employees the greatest possible immunity from accident; and it was not deemed necessary to prescribe any form because it was the best theoretically or because working the best when coupling with itself. Considerable disappointment was felt by

several inventors who believed that their devices possessed points of merit and value superior to those selected, but the commissioners say in defense that, while those devices might have been prescribed or recommended had their authority extended over the continent, yet, remembering that there now are, and are likely to be for some time to come, over 1,000,000 freight cars in the country equipped with the link and pin, the practical advantage of the forms prescribed outweighed the possible theoretical superiority of the others which were rejected. Beside this, the law gives the commissioners the right at any time to annul their recommendations and prescribe other couplers which may be proved to be superior on subsequent examination. It is a reform which, they say, must necessarily be slow, as it requires the perfection of invention and the concurrence of many States. The automatic safety couplers prescribed in Massachusetts are the Janney, the Hilliard, the Cowell, the United States and the Ames. This order went into force March 1, 1885. It is much broader than the enactment of New York, which only requires the safety couplers to be placed on new cars hereafter to be constructed, while in Massachusetts it applies both to new cars and those already owned by the railroad companies.

The great difficulty in the way of all such legislation is want of uniformity between the different States, and the value of any legal compulsion in the matter depends upon the extent to which any one particular device is used. Such a law in force in one State possessing a large commerce with other States which have no similar law or uniform regulations cannot be perfectly effective, so far as the saving of life and limb, or the prevention of accidents generally, is concerned. At the same time it involves considerable expense to the railroad companies, with but, as many of them claim, any corresponding benefit. Many of the managers have strongly disapproved of any change in the present system, partly on the ground just stated, and partly because they do not appreciate existing evils or have little faith in automatic devices. But the introduction and use of such couplers have already been the means of averting many accidents of this nature in a State like Connecticut, at a time when it was the only State having such a law. If appreciably beneficial results have been attained in a State through which pass so many foreign cars with the old attachments, what may not be expected when the contiguous States of Massachusetts and New York have succeeded in effecting the introduction of uniform safety couplers. The influence of this action cannot fail to influence other States. While it is perfectly true that everything cannot be accomplished until more than 30 Legislatures have acted in the matter, this would seem to be no reason why action should have been deferred by any State, as many railroads have urged, until all the others have legislated together.

The indifference and opposition of many railroads to the scheme hitherto (although several roads have favored it and introduced the safety couplers without compulsion) is explained by the fact of the heavy cost and the peculiar rule of the common law in regard to the non-liability of employers for the death of or injury to their employees. The railroad company is not liable to employees for death or injury occasioned under circumstances which would make it liable to passengers and others. It is not responsible to them where the accident was caused by the fault or negligence of a fellow-employee. In fact, the instances are rare in which it is liable at all; the employee is considered legally as assuming all the risks and danger incident to his employment. This condition of the law is anomalous and unjust, and will doubtless soon be changed, but there can be no doubt that the immunity of the companies from prosecution for damages on the part of injured employees has had much to do with their want of alacrity in voluntarily adopting the methods proposed. It must be said, however, in justice to the managers of the roads, that they regard such accidents as almost in every case due to the carelessness of the brakeman. This may be conceded, but there is no reason why men should not be protected even against their own carelessness.

Much has been expected and is expected in all the States of the Master Car Builders' Association. It was this association which in 1874 first reported in favor of automatic couplers, the report being made by Mr. F. D. Adams, the master car builder of the Boston and Albany Railroad. The association has been urged to adopt a standard coupler in the construction of freight cars. This body has no legal authority, but its recommendations cannot fail to have great weight with the railroads in all parts of the country. A resolution passed by it would do more toward securing uniformity than any legislative enactment. But so far the association has not seen fit to take any step in that direction.

We are glad to observe that the *Iron Trade Review* has abandoned the \$10 iron of Ohio. It attempts to cover its retreat in a very peculiar manner. Our contemporary has suddenly discovered, what every blast-furnace man in the country has long known, that the furnaces at South Chicago are doing some good work. The record of the operations of that plant is simply another proof that it will not do to guess at cost of fuel in making iron on the basis of a consumption of 1½ tons of coke when less than a ton will do.



It is pointed out that, since the pig iron is used in direct working, the quantity and quality must be regular and uniform. It would be interesting to learn from Mr. Potter, of the North Chicago Rolling Mill Company, how his silicon runs from blow to blow, whether it does not happen to him that he must convert into good steel occasionally iron running as high as, say, 4 per cent., and as low as  $\frac{1}{2}$  of 1 per cent.

#### The Saturday Half-Holiday Movement.

The Saturday half-holiday movement is gaining headway in the hardware trade of New York, as will be seen from the list elsewhere printed in this issue of the signatures already secured to the agreement to close at 1 o'clock Saturdays during July and August. This movement is a wholesome one, and deserves encouragement. In this country our hours of business are too long. During half the year all the business actually done could be transacted between the hours of 10 and 3, and if this were the rule no one would be inconvenienced. But while it is scarcely possible to bring about such a change, especially during the life of those brought up under the old system of long hours, it is both possible and desirable to establish the Saturday half-holiday during the hot months of the summer. The time lost by closing at 1 o'clock has no practical value. Clerks will if necessary work the harder to complete their duties, and employers' interests will not suffer. There are no doubt a few in the trade who will refuse to agree to the arrangement. One or two have already expressed themselves as opposed to it, on the ground that they had no such privileges in youth and are the better for not having had them. They believe that the Saturday half-holiday encourages vicious habits and improper indulgences. On the contrary, we believe that too much restraint and confinement encourages excesses in moments of leisure, and has a bad influence, morally and physically. We are sure that employers who give their clerks the half holiday will gain on Mondays more than they lose on Saturdays, and that if they consider the wishes of their clerks in the dull season the clerks will make the more willing sacrifices for them when each day's work extends far into the night.

It is a fact worthy of notice and of some significance that prices of bar iron in England and in this country are approaching one another more and more. Thus, while Staffordshire marked bars are selling at £7 to £7.10 in England, equivalent to about 1.56 to 1.62 cents, American refined bar iron equal to it in quality is selling in tidewater markets in large lots at 1.7 to 1.8 cents a pound, or about 1.65 to 1.75 cents at mill. Our American consumers of bar iron are therefore paying very little more for this article than those in England. In common iron the difference is greater. Common Staffordshire bars are being sold at £5.5 to £5.10, equal to 1.14 to 1.19 cents, while under special circumstances common iron has sold in the New York and Philadelphia markets as low as 1.4 to 1.45 cents, equal to 1.35 to 1.4 cents at mill. When the difference in the cost of labor, of pig iron and of coal is taken into account, the slight apparent balance in our favor is quickly wiped out. Steel rails are selling in England at shipping ports at figures equivalent to \$23. Here they could possibly be purchased at tidewater for \$27. There the mills can buy Bessemer pig at \$10 to \$10.25 for equal quantities of Nos. 1, 2 and 3; here the steel-rail makers are doing exceedingly well if their average cost is \$15 to \$15.50 at mill. Taking the two lower figures respectively, and adding a fair percentage for waste, the difference in the cost of pig iron alone is \$5.75, while no account whatever is taken for greater cost of labor of refractories and of spiegel. American consumers of iron and steel certainly have no reason to complain.

The Scranton Steel Company, who have recently suffered from the efforts of local labor agitators to force union methods into their business relations with their men, have, under date of 26th ultimo, issued a notice which is a new departure in the American iron trade. In order "to encourage continuous faithful work," the company announce that they will make "monthly presents" to their employees of a bonus of  $\frac{1}{2}$  of 1 per cent. of their monthly due bills for every six months they have worked for the company continuously over and above one year's services; for every six months added to the time of continuous service of an employee a bonus of  $\frac{1}{2}$  of 1 per cent. is added up to five years, when the percentage is not increased. When that period is reached, however, the employee is receiving an advance of 5 per cent. over the wages paid to men doing the same work who have not served the company so long. The latter distinctly state that this bonus is a present and may be discontinued at will, at any time, should the custom not work to their satisfaction. The experiment is one that will be watched with interest. It is a recognition of the fact that it is advantageous to the employer to have those engaged in his mill work continuously. There is always a floating laboring population which is apt to be troublesome and occasionally gets the upper hand in the councils of the men, forcing the more conservative element into acquiescence of its dictates. Everything that tends to strengthen the hand of the conservative,

and generally more intelligent, part of the force should be done by employers, even at a sacrifice. We look upon the move of Mr. W. W. Scranton as the outgrowth of that feeling, and trust that his plan may prove successful.

#### The Clapp-Griffiths Process.

Mr. R. W. Hunt informs us that there are some errors in the supplementary paper on the Clapp-Griffiths process published last week. On page 17, 4th column, 50th line from the top, occurs the sentence: "A steel with carbon, .31; silicon, trace; phosphorus, .4, gave tensile strength, 77,460; elastic limit, nil; elongation, .05 per cent." It should read, "elongation, .62 per cent.," as .05 was the extension in inches measured in 8 inches.

Two other errors grew out of the fact that the actual loads, and not the loads figured in pounds per square inch, were printed. Thus in the 59th line: "A sample with carbon, .08; silicon, trace; sulphur, .03; phosphorus, .72; manganese, .5, possessed tensile strength, 75,290; elastic limit, 15,200." It should be, "elastic limit, 69,150." Beginning with line 64, the sentence, "while metal with carbon, .13; silicon, trace; phosphorus, .85; manganese, .73, had tensile strength, 101,540; elastic limit, 25,500," should read, "elastic limit, 74,080 pounds per square inch."

#### The Eastern Pig Iron Association.

The members of the Eastern Pig Iron Association and their friends, in accordance with the arrangements made by their committee for the second annual excursion of the association, assembled at Plattsburg, N. Y., on the morning of Tuesday, June 23, 1885. The party, numbering about 75, were received by F. S. Witherbee, chairman; W. W. Van Voorhis and A. L. Inman, of the committee, and Hon. Andrew Williams, Hon. Smith M. Weed and Hon. Wm. E. Smith. At 8 a. m., accompanied by those gentlemen, the party visited the mines of the Chateaugay Ore and Iron Company, at Lyon Mountain, one of the peaks of the Adirondacks, 34 miles west of Plattsburg. The company were formed in 1881. They own 90,000 acres of mineral, timber and other lands. The present productive capacity is 500,000 tons per annum of ore, yielding 50 per cent. and upward of metallic iron. Their forges have a capacity of 18,000 tons a year of charcoal iron. The products of their works are brought to water communication on Lake Champlain, at Plattsburg, over the Chateaugay Railroad, owned by the company. The company employ 2500 men. A fine luncheon was served on the mountains. On the return, upon the invitation of Warden Fuller, the party visited the Clinton State Prison, at Dannemora.

On Wednesday morning the party left on the Champlain transportation steamer Vermont, arriving at Port Henry at 11 a. m. They here visited the Bay State Iron Company furnaces, and thence by train inspected the ore properties and works of Witherbee, Sherman & Co., the Bay State Iron Company and the Port Henry Iron Ore Company. The party made the descent of the mines of the first and last named companies. The ore averages 66 per cent. and is largely used for puddling and blast-furnace purposes in the Middle and Eastern States. A fine luncheon was served. Returning to Port Henry, through the courtesy of the Delaware and Hudson Canal Company the party visited the furnaces of the Crown Point Iron Company, 8 miles below. This company also operate a charcoal forge and extensive mines of Jessemer ore. On returning to Port Henry as party inspected the property of the Port Henry Steel and Iron Company. The company have leased the Cedar Point Furnace of Messrs. Witherbee, Sherman & Co., and are erecting a Clapp-Griffiths steel plant to run the metal directly from the furnace to the converter. This furnace was the first in the United States to adopt the Whitwell hot-blast stoves.

The same evening the regular annual meeting and election of officers were held at the residence of Mr. F. S. Witherbee. A number of new furnaces had been elected to membership in the association, and the reports of the secretary and treasurer were read at a special meeting at Plattsburg. At the regular meeting the following officers were elected for the year 1885-86: President, Henry S. Eckert, Henry Clay Furnaces, Reading, Pa.; vice-presidents, Henry McCormick, Paxton Furnaces, Harrisburg, Pa.; W. W. Van Voorhis, Manhattan Iron Works, Manhattanville, Pa.; F. A. Comly, Longdale Iron Company, Virginia, Philadelphia, Pa.; F. S. Witherbee, Messrs. Witherbee, Sherman & Co., Port Henry, N. Y., and Edwin Mickle, Thomas Iron Company, Hockendauqua; secretary, de B. Randolph Keim, Washington, D. C.; treasurer, J. Wesley Pullman, Andover Iron Company, Philadelphia, Pa.

Resolutions of thanks were passed as follows: To Hon. Andrew Williams, Hon. Smith M. Weed and Mr. A. L. Inman, and their associates of the Chateaugay Ore and Iron Company, the Champlain Transportation Company, Messrs. Witherbee, Sherman & Co., the Port Henry Iron Ore Company, the Crown Point Iron Company, the Delaware and Hudson Canal Company and the committee of the Eastern Pig Iron Association, consisting of F. S. Witherbee, of Witherbee, Sherman & Co., Port Henry, N. Y., chairman; A. L. Inman, general manager Chateaugay Ore and Iron Company, Plattsburg, N. Y.; A. Tower, Poughkeepsie Iron Company, Poughkeepsie, N. Y.; Henri M. Braem, Fallkill Iron Company, N. Y.; J. W. Hoysradt, Hudson Iron Company, Hudson, N. Y.; and W. W. Van Voorhis, Manhattan Iron Company, Manhattanville, N. Y., for their admirable arrangements for the enjoyment of the members and friends of the Eastern Pig Iron Association during their visit to the Lake Champlain iron district. Letters were read from Geo. de B. Keim, president Philadelphia and Reading Railroad; Robert Coleman, Colebrookdale Furnaces, Lebanon, Pa.; Richard Peters, of Chester Rolling Mills, Pennsylvania, and others, regretting their inability to be with the party.

After the meeting a collation was served at the residence of Mr. F. S. Witherbee, thus

bringing to a close the second annual excursion of the Eastern Pig Iron Association.

On Thursday morning about one-half of the party accepted an invitation to return by way of Lake George, en route visiting Fort Ticonderoga and enjoying a rest at the summer residence of Mr. Henry Moore, president of the New York Lighterage Company, New York City.

The following is a list of members of the Eastern Pig Iron Association and their friends who were present at the meetings: Henry S. Eckert, Henry Clay Furnaces, Reading, Pa., president E. P. I. A.; F. S. Witherbee, Witherbees, Sherman & Co., Port Henry.

W. W. Van Voorhis, Manhattan Iron Company, Manhattanville, N. Y., and A. L. Inman, general manager Chateaugay Ore and Iron Company, Plattsburg, N. Y., members of the Committee on Arrangements.

De B. Randolph Keim, secretary, Washington, D. C.

J. Wesley Pullman, treasurer, Andover Iron Company, Philadelphia.

Hon. Smith M. Weed, Plattsburg, N. Y.

Hon. Andrew Williams, president Chateaugay Ore and Iron Company, Plattsburg, N. Y.

Hon. William E. Smith, Plattsburg, N. Y.

Hon. Isaiah Fuller, Dannemora, N. Y.

E. S. Moffat, Lackawanna Iron and Coal Company, Scranton, Pa.

W. A. Ingham, Rockhill Iron and Coal Company, Philadelphia, Pa.

Henry McCormick, Paxton Furnaces, Harrisburg, Pa.

A. Pardee, Jr., Musconetcong Iron Works, Stanhope, N. J.

W. J. Taylor, Chester Furnace, Chester, N. J.

Alfred Marshall, Marshall Furnace, Philadelphia, Pa.

J. Howard Marshall, Marshall Furnace, Philadelphia, Pa.

Alexander Hooven, Norristown Iron Works, Norristown, Pa.

Richard Wood, Randolph Furnace, Philadelphia, Pa.

Wm. M. Heavey, Macungie Iron Company, Macungie, Pa.

J. C. Kent, Andover Iron Works, Phillipsburg, N. J.

T. F. Witherbee, Port Henry, N. Y.

Walter C. Witherbee, of Witherbees, Sherman & Co., Port Henry, N. Y.

Edward Bailey, Glasgow Iron Company, Pottstown, Pa.

P. R. Stetson, Leesport Iron Company, Reading, Pa.

E. E. Stetson, Reading, Pa.

George B. Eckert, Henry Clay Furnaces, Reading, Pa.

Isaac Eckert, Topton Furnace, Topton, Pa.

Geo. T. Barnes, Crane Iron Company, Philadelphia, Pa.

L. H. Taylor, Jr., Philadelphia, Pa.

Edwin Mickle, Thomas Iron Company, Hockendauqua, Pa.

E. M. Cook, West Point Furnace Company, N. Y.

Edgar S. Cook, Warwick Iron Company, Pottstown, Pa.

H. B. Nillard, Cedar Point Iron Company, Port Henry, N. Y.

Walter Wood, R. D. Wood & Co., Philadelphia, Pa.

George Davis, Norway Furnace Company, Pottstown, Pa.

W. T. Foot, Bay State Iron Company, Port Henry, N. Y.

D. H. Thomas, Thomas Iron Company, Hockendauqua, Pa.

Francis E. Weston, Crozer Iron and Steel Company, Upland, Pa.

H. V. L. Meigs, Pennsylvania Bolt and Nut Company, Lebanon, Pa.

George Richards, Glendon Iron Company, Dover, N. J.

Walter S. Green, Crown Point Furnace, Crown Point, N. Y.

H. L. Reed, Crown Point Iron Company, Crown Point, N. Y.

Geo. G. Rowe, superintendent Port Henry Iron Ore Company, Port Henry, N. Y.

Andrew Dickey, Port Henry Steel and Iron Company, Port Henry, N. Y.

L. H. Taylor, Jr., Philadelphia, Pa.

Dr. H. K. Hartzell, Allentown, Pa.

James Colhoun, Philadelphia and Reading Railroad, Philadelphia, Pa.

Edward H. Bell, Philadelphia and Reading Railroad, Philadelphia, Pa.

Alfred Earnshaw, Philadelphia, Pa.

C. H. Henson, Allentown, Pa.

Augustus Canfield, Dover, N. J.

Henry Henderson, Philadelphia, Pa.

Fred. D. Owen, Washington, D. C.

John Jarrett, secretary American Tinned Plate Association, Pittsburgh, Pa.

W. R. Hart, Philadelphia, Pa.

Austin G. Gorham, Chateaugay Ore and Iron Company, N. Y.

Frederick Engle, New York City.

Mr. Bertolet, Crown Point Iron Company, N. Y.

D. S. Hasbrouk, Troy, N. Y.

Charles Wood, Philadelphia, Pa.

The following is a sample of the kind of stuff with which so-called American correspondents of English newspapers regale readers on the other side: "American competition with the Staffordshire nail trade is overreaching itself, and the recent development of production has so far outstripped the demand, present and prospective, in this and every other nail-consuming country that most of the American mills are shutting down two weeks out of every four. I have recently made a trip through the nail regions, and am forced to the conclusion that, on the whole, the population dependent on this industry is worse off than similar communities in England; and that, if it were not for protection, the making of nails, whether iron or steel, would not stand against English competition six months. As it is, many manufacturers are disgusted with the results of the past half-year's work, coming on the tail of a prolonged period of unexampled depression, and are talking seriously of going out of the business and turning their capital to more profitable account in other directions. It would be a sorry day for American manufacturing interests if the statesmen of Great Britain were to adopt a discriminatory tariff. The tariff is fully recognized here, and the trade papers are eagerly watching the progress of the fair-trade movement in England."

#### The Rupture in the Western Iron Association.

The following information from Western sources, relative to the threatened disruption of the Western Iron Association, will be read with interest:

CINCINNATI, June 26th.—The iron manufacturers west of Pittsburgh, in conference at Cincinnati, have finally decided to withdraw from the Western Iron Association. The discussion was spirited throughout the meeting as to the resolutions, which were as follows:

Whereas, The action of the Pittsburgh committee in the settlement of the recent difference existing between the manufacturers and workmen was ill-timed, unsatisfactory and subversive of our interests; and

Whereas, It is the sense of the manufacturers located in the Mahoning and Shenango valleys, in Cincinnati, Youngstown, Wheeling and other outside districts, that some steps be taken to avert a repetition of such unwarranted conduct, now, therefore, be it

Resolved, That we, the manufacturers in the aforesaid districts, hereby protest against a continuance of Pittsburgh dictation, and agree to encourage the formation of an independent organization for the purpose of adjusting our own grievances and for settling questions of labor with the Amalgamated Association.

All the Western mills outside of Cincinnati were a unit for the passage of this resolution, and but two within the city urged any objection to its speedy and peremptory passage. The objection urged by the Cincinnatians was founded upon the assumption that there already existed a definite agreement between the Cincinnati manufacturers and the Amalgamated workmen to the effect that any arrangement entered into in Pittsburgh was binding upon Cincinnati; that Cincinnati was a tail to the Pittsburgh kite now and forever, one and inseparable, and it mattered not to what extent conditions might be altered, Cincinnati was bound in honor to obey.

The remainder of the Cincinnati manufacturers joined with the representatives of the other districts in maintaining independence and advising adverse action to the Pittsburgh settlement. They maintained that Cincinnati was under no obligations whatever, and that the faintest shadow of a claim for any such restraint had been violated by the Amalgamated Association in their refusal to continue operations while Pittsburgh was idle. They claimed, furthermore, that the Pittsburgh committee was controlled by a few bankrupt institutions which were forced into operation, and that in the present condition of trade it was not only unwise, but almost outrageous, to attempt, by adherence to such an unreasonable agreement, to drag solvent institutions into the same slough of despair.

The question was finally brought to a vote, and passed with but two dissenting votes. A modified proposition was voted down with decision, and a determination manifested to express the sentiments of the objectors to the Pittsburgh committee with no uncertain sound. The meeting then adjourned subject to the call of its chairman, and it is the privilege of any mill desiring to run under the terms of the Pittsburgh scale to light up its furnaces until it shall be decided at some subsequent conference to withdraw. It is not likely, however, that many will run.

YOUNGSTOWN, OHIO, June 27.—There is a strong belief here that a new and strong association will be formed, sufficiently powerful to leave the Pittsburgh manufacturers in the minority. Youngstown millowners are very bitter against Pittsburgh, and this feeling has been increased each year. They feel that they are entirely at the mercy of the Pittsburgh faction, and now that this sentiment has pervaded other districts, the new association is being urged forward.

PITTSBURGH, June 28.—Iron manufacturers here are not surprised at the course the Western manufacturers decided upon at the Cincinnati meeting. One of the most prominent manufacturers in the city said to-day that he was surprised that the Ohio manufacturers had not broken loose from the dictates of Pittsburgh manufacturers long ago. He thought the result very discouraging to Pittsburgh. In Cincinnati, he said, the work could be done 10 per cent. less than here. Secretary Martin, of the Amalgamated Association, said this afternoon that the action at Cincinnati would not affect the association. The talk of all the mills running non-union men was nonsense. He did not think they would run until the scale is signed.

Dr. André, of Leipzig, discussed before a recent meeting of the Anthropological Society of Vienna the question whether iron was known in America in pre-Columbian times. Meteoric iron was certainly in use among certain Indian tribes and the Esquimaux, but Dr. André thinks that they were wholly unacquainted with the art of forging iron. This conclusion is based on the fact, among others, that while there is ample proof that the Indians knew how to obtain and employ gold, silver, tin, copper, quicksilver, &c., we hear nothing of iron mines in the history of civilization of ancient America. The language itself proves this, for there is no expression for iron. Some writers, it is true, speak of the word *panique* as that for iron, but it really means metal in general. Moreover, in prehistoric, or rather pre-Columbian, graves, especially in the rainless regions of Peru and Northern Chili, ornaments of all kinds, weapons and implements, are found, but no objects in iron have been discovered, although the Indians placed their most valued articles in their tombs. There is no reason, he thinks, to believe that the tools employed in the great Maconry works of Peru, such as that at Tiahuanaco, were other than those in use in the rest of Peru, which were of *champi*, a species of bronze. The chisels found in Peruvian graves soon become blunted when used on the hard strut, but it is suggested that there was some method of sharpening them easily. Indians certainly have worked a hard stone like nephrite without iron, and there is no improbability, says the writer, in the theory

that these chisels were employed, when we recollect the patient temperament of the Indians, who for generations were accustomed to the repetition of the same work, to indolently pursuing a uniform task, and also that *gutta cavat lapidem*.

#### An English View of Trade Depression.

Mr. Giffen, an English authority on economical subjects, has contributed to the June *Contemporary* a paper on trade depression in Great Britain and other countries, but chiefly England. He maintains that what is called the "depression" in trade is in a great degree exaggerated. There has been a decline in the amount of business done by the English nation, but it is comparatively trifling—a mere fluctuation such as has repeatedly occurred, and much less severe than that which followed 1866. The foreign trade of the country has declined by 6 per cent., the freight traffic of the railways by about  $\frac{1}{2}$  per cent., and the production of pig iron by 10 per cent., but the remaining reductions are nearly imperceptible. But there has been a fall in prices which has astounded and in some cases ruined the oldest calculators, and which apparently proceeds from some general and far-reaching cause, and which all over the world has brought values down to a figure previously unknown. The following table shows, in a way every one can understand, the range, the continuousness, and the extent of this fall in the great articles of consumption:

Prices of Leading Wholesale Commodities in January, 1873, 1879, 1883 and 1885, Compared.

	1873.	1879.	1883.	1885.
Scotch pig iron, per ton.....	127/30	43/19	47/8	41/9
Coals, per ton.....	30/	19/	17/6	18/
Copper, Chili b's, per ton.....	£31	£27	£25	£24 1/4
Straits tin, pr. ton.....	£142	£61	£58	£77 1/2
Wheat, average per qr.....	55/11	30/7	40/4	34/11
Wheat, red sprig, at New York, per bush.....	\$1.70	\$1.10	\$1.18	91c.
Four-town made, per sack.....	47/0	37/	38/	32/
Flour, New York price, per bul.....	\$7.50	\$3.70	\$4.30	\$3.35
Beef, inferior, per 8 lbs.....	3/10	2/10	4/4	4/
Beef, prime, small, per 8 lbs.....	5/3	4/9	6/	5/4
Cotton, Middling Upland, per lb.....	10d.	5 1/2d.	5 1/2d.	6d.
Wool, per sack.....	£23	£13	£12	£11
Sugar, Manila Mus., per cwt.....	31/6	16/	16/0	10/
Coffee, Ceylon, good red, per cwt.....	80/	65/	78/6	71/
Pepper, b'k Malabar, per lb.....	7d.	4 1/2d.	5 1/2d.	8d.
Saltpetre, foreign, per cwt.....	29/	19/	19/	15/8

A fall like this, as Mr. Giffen points out, frightens experienced dealers, who, though they expect fluctuations, are not prepared for catastrophes, and, by raising the impression that calculation is futile, embitters and depresses them even more than their losses do. They feel as if fate were against them, and actually, in some trades—notably copper—refuse to make calculations, declaring publicly that something has happened to copper, and that their experience is of no value. Moreover, though Mr. Giffen does not mention this, the fall disarms the classes most able to proclaim their sufferings aloud. The country suffers nothing from it, for the distributor and consumer reap between them the whole benefit; but the producers feel as if the heavens had suddenly been overcast. Every owner of arable land, every tropical planter, every holder of mining property, and every wool grower, has become poorer, often to a ruinous extent, and sees no prospect except of becoming poorer still. Take as two well-known illustrations the position of men who hold shares in Australian sheep-runs or in the smaller copper mines. The former have been docked of half their receipts, the latter of all, for the fall in copper has passed the point at which profit is obtainable. Naturally, all these classes cry aloud, and swell the volume of the dealers' complaints, and declare that the country, which is quite unhurt, is rapidly progressing toward ruin. There has been, in truth, a vast transfer of property to the multitude at the expense of proprietors, and they cannot endure the process. Every man who wants copper gets it at half the price he paid in 1873, and while he is silent, or perhaps even ignorant—for the copper-smith pockets much of the difference—the seller of copper cries with alarm.

The facts are unmistakable and not denied, but there is argument as to their explanation. One theory is overproduction, and no doubt in some trades there has been overproduction; but this cause alone could not produce so general a fall. "There is no reason," says Mr. Giffen, "to suppose that the multiplication of commodities relatively to the previous production has proceeded at a greater rate since 1873 than in the 20 years before that. Yet before 1873 prices were rising, notwithstanding the multiplication of commodities; and since that date the tendency has been to decline." There must, therefore, be some other cause, and Mr. Giffen finds it, as Mr. Goachen found it, in the appreciation of gold, owing to the diminished production of the metal and to its nearly universal adoption as the currency of the European peoples. The world has absorbed in 13 years £200,000,000 of gold, and the annual production now scarcely repairs waste; even with the increased quantity of coin liable to attrition it does quite repair it. There is, in fact, a "strain" upon the metal which it can scarcely bear—a competition for it which steadily raises its price as expressed in commodities, and which, for one curious result, has almost arrested the coinage of gold at the British Mint. For the 10 years ending 1870 the mint coined £5,000,000 a year; in 1871 nearly £10,000,000, and in 1872 £15,000,000; but since that year the average has been £1,500,000 only. There is, in truth, too little gold for the increasing business done; and as it is the universal standard in Europe and North America, the "shrinkage of values" in Europe and North America has been universal, and has made perceptibly less rich all men not living on fixed incomes or on wages.



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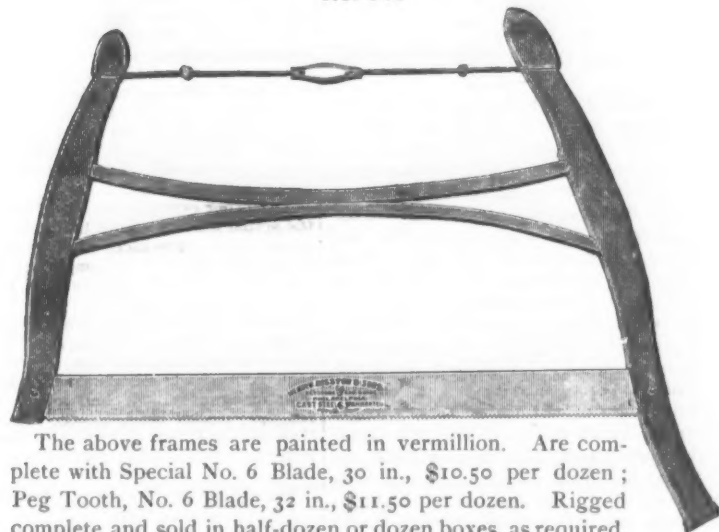
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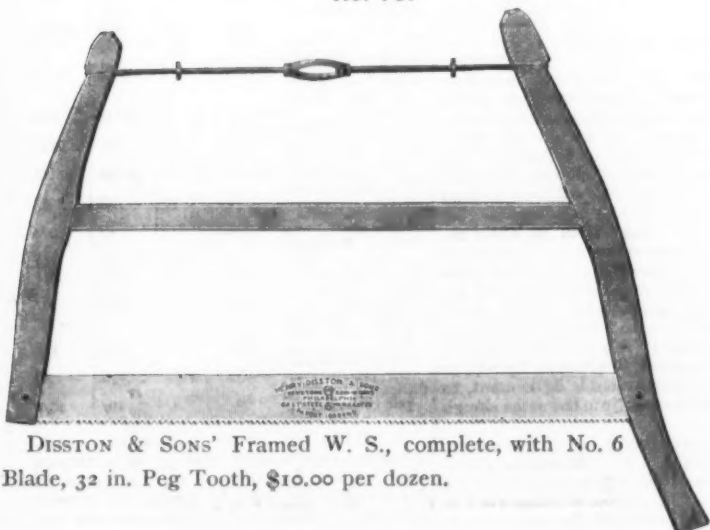
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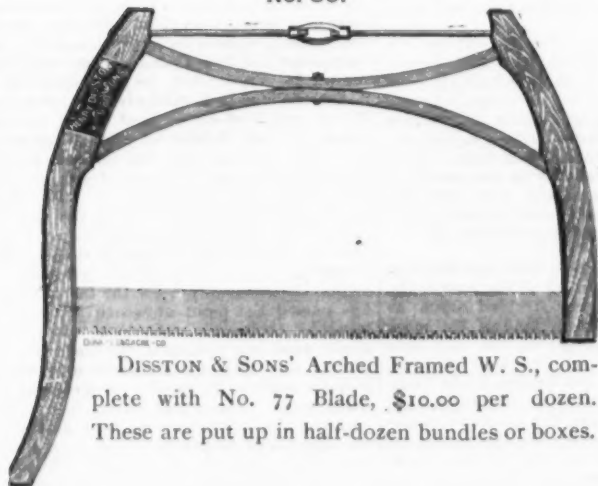
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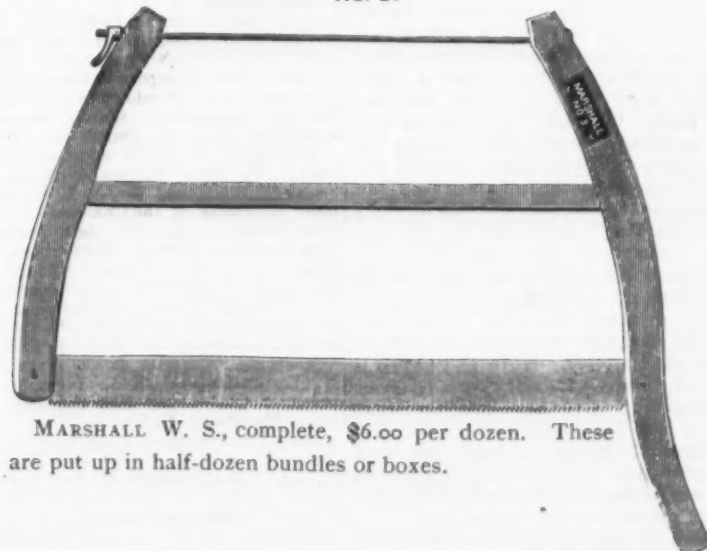


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Manager Selling Department.

Booth's Business Bureau, 124 Griswold St., Detroit, Mich.

We refer to R. G. Dun &amp; Co.

## Special Notice.

New York, May 1, 1885.  
 We beg to notify our customers and the trade generally, that in order to secure greater convenience and efficiency in filling orders for the Beauty Hammer and our other goods, in New York and Pennsylvania, and adjacent territory, we have established a

## BRANCH OFFICE and WAREHOUSE

at

No. 49 Dey Street, New York City.

from which office all our business in that section will be promptly attended to.

BEAUCY &amp; CUNNINGHAM.

Manufacturers of the Beauty Hammer.

Principal Office, Mason Building, Boston, Mass.

Also, Machine Knives, Hardwood Heating

Forges, Shears, Steam Hammers, Gas Engines, Iron and Steel.

## Trade Report.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, July 1, 1885.

Scotch Pig.—The market is irregular. We quote makers' brands as follows:

Coltness, alongside, Glasgow	48/6
Langloan, " "	48/6
Gartsherrie, " "	47/6
Summerlee, " "	47/6
Carnbroe, " "	46/6
Glengarnock, " Ardrossan	46/6
Eglinton, " "	41/6
Dalmellington, " "	44/6
Shotts, " at Leith	45/6

Cleveland Pig.—Is unchanged. We continue quotations, f.o.b. shipping ports:

Middlesboro, No. 1 Foundry	36/6
" " No. 2	35/6
" " No. 3	32/6
" " No. 4 Forge	32/6

Bessemer Pig.—Is unchanged. W. C. Hematites are quoted 43/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is irregular. We quote at works:

Staff. Ord. Marked Bars	7 10 0 @ 10 0
" " Medium	6 0 0 @ 6 10 0
" " Common	5 10 0 @ 5 15 0
Hoops, 20 W. G. and over	
" " Common Best	6 15 0 @ 6 15 0
" " Medium	6 5 0 @ 6 10 0
" " Common	6 0 0 @ 6 7 6
Sheets, 20 W. G. and under	
" " Ordinary Best	7 15 0 @ 8 5 0
" " Common	7 5 0 @ 7 15 0
Welsh Bars	4 17 6 @ 5 2 6

Steel Rails.—Are unchanged. We quote £4. 15/ f.o.b. shipping ports.

Old Rails.—Are unchanged. We quote Old D. H's, c.i.f. New York, £3 @ £3. 2/6.

Scrap.—The market is unchanged. We quote Heavy Wrought £2. 10/ @ £2. 15/ c.i.f. New York.

Copper.—The market is unchanged. We quote Best Selected, £48. 10/ @ £49. 10/ and Chili Bars, £44 @ £44. 10/.

Tin.—The market is a little weaker. Straits Tin, spot, is quoted £95 @ £95. 10/.

Tin Plates.—Are firmer. Manufacturers are considering a proposition to restrict production 25% for an indefinite term. We quote:

Tin Plates, 10x14, 1st qual. Charcoal	19/6 @ 21/6
" " " 1st " " Coke	18/6 @ 19/6
" " " 2d " " " "	17/6 @ 18/6
" " " 2d " " " "	16/6 @ 17/6

Spelter.—The market is unchanged. We quote Ordinary, at shipping ports, £13. 17/6 @ £14.

Lead.—The market is quiet. We quote Common English Pig, £10. 12/6 @ £10. 17/6.

Freights.—Steam from Glasgow to New York, 1/ @ 2/.

## Financial.

Office of The Iron Age,

WEDNESDAY EVENING, July 1, 1885.

There are several indications of growing confidence in the stability of values, mainly due to discreet Treasury management and to the satisfactory condition of our foreign commerce, but it cannot well be said that there is any positive improvement or that any can be expected during the usual dull period of the summer months. Lower prices are recorded for breadstuffs, provisions and cotton, the latter 1/4¢, and this simultaneously with a sharp speculative advance in crude petroleum from 80¢ to 94¢ per barrel, with sales exceeding 9,000,000 barrels in a single day, and three operators who were unable to meet their obligations went to the wall. There was more activity in spring wheat, shippers being enabled by lower prices to make considerable purchases, but winter wheat is much above a shipping basis, and the week closes with little encouragement, foreign markets being depressed, while the New York Produce Exchange reports a larger visible supply than was expected. The first installment of new wheat known as Southern amber sold in this market on Saturday at \$1.50 per bushel. Provisions are barely steady. Cotton is weak in prospect of an immense crop soon to mature, and another consequence is the promise of a good general trade in the South and Southwest. In dry goods there is no special request, but the best manufacturers of woollens are employed in the execution of orders to the extent of their production.

The exhibit of general business afforded by the returns from leading clearing houses throughout the United States continues somewhat unfavorable, both when compared with that of last week and that of the corresponding week of last year. In the Southern cities the situation is, if anything, slightly improved, and the clearings at New Orleans and Memphis both show a gain. In Boston the increase must be attributed to the main to the active dealings in Mexican Central securities. New York, on the other hand, continues to show a heavy decline, equal to 26¢ compared with 1884. The Stock Exchange markets were irregular and generally lower. On Thursday

Pacific Mail dropped 3/4, due to the loss of the steamer City of Tokio, and for a time there was a free selling of the Vanderbilts and grangers. On Friday Pacific Mail again declined, the grangers were weak, and the whole list had a declining tendency. West Shore advanced on more favorable reports from the Taylor committee. On Saturday and Monday Delaware and Lackawanna was the object of vigorous attack, transactions in this stock making one-half of the day's business, and Delaware and Hudson declined in sympathy. The grangers were comparatively steady. On Tuesday the market was unsettled. New York Central advanced on the declaration of a dividend of 1 1/2 %—the smallest ever declared, but larger than was expected. The statement of the Michigan Central was said to show a deficit of \$240,000, and Lake Shore was behind about \$85,000 on the business of the last six months. To-day Lake Shore, Lackawanna, New York Central, Pacific Mail and Union Pacific are 1/2 @ 3/4 lower, but most of the list fractionally advanced, closing as follows: Lackawanna, 93 3/4; Erie, 9 3/4; Lake Shore, 55; New York Central, 83 1/2; Pacific Mail, 49 3/4; Union Pacific, 50 1/2; Canada Southern, 30; Central Pacific, 30 3/4; Delaware and Hudson, 76 1/4; Kansas and Texas, 17 1/4; Louisville and Nashville, 35; Missouri Pacific, 95 1/4; Jersey Central, 39 1/4; Northwestern, 93 1/4; St. Paul, 71 1/4; Texas and Pacific, 11 1/4; Western Union, 60 3/4.

United States bonds closed as follows:

	Bid.	Asked.
U. S. 3 per cents	103 1/4	103 1/2
U. S. 4 1/2, 1891, coupon	112 1/4	112 3/4
U. S. 4 1/2, 1897, coupon	122 1/4	122 3/4
U. S. Currency 6s, 1890	127 1/4	—
U. S. Currency 6s, 1892	128 1/4	—
U. S. Currency 6s, 1897	130 1/4	—
U. S. Currency 6s, 1898	133 1/4	—
U. S. Currency 6s, 1899	135	—

\* Ex-coupon.

The weekly bank statement issued from the Clearing House on Saturday showed that the surplus reserve had increased \$53,925. The changes in the averages show an increase in loans of \$4,851,700, a decrease in specie of 649,700, an increase in legal tenders of \$2,901,700, an increase in deposits of \$5,012,300, and a decrease in circulation of \$68,100. The surplus reserve is now \$63,394,425. The returns include those of the Seaboard, recently admitted to the association. Money still flows toward this center, though in reduced volume, and money promises to remain easy during the remainder of the season. Money is in some better demand in the West.

The rates of sterling exchange are quoted \$4.85 @ \$4.86. In London the value of money is perhaps lower than ever before, the best three months' bills being done at 1/2 %, and investors eagerly seek remunerative employment for their capital. Tenders for a Canadian 4 % loan of \$20,000,000 brought out subscriptions for three times that amount. Similar conditions prevail in Paris and Berlin. The local supply is augmented by the regular July dividends, which in New York alone amount to some \$60,000,000, Boston and Philadelphia together bringing up the aggregate to about \$80,000,000. Payments on the part of the Government approached \$9,500,000. The few defaults occurring were not beyond expectations. In seeking an explanation for the excess of idle capital, one of our financial writers says, not unreasonably, that it is because those who own the money distrust railroad properties and the men who manage them; because reckless building of useless lines, overcapitalization, the speculations of presidents and directors, the payment of unearned dividends on doubled stock, cooked reports and a hundred other fraudulent practices have frightened capital, and when it is frightened it seeks safety in banks before looking for income.

The imports of merchandise at the port of New York during the past week were \$183,255 below those of the previous week, the total valuation being \$6,819,567, of which about \$1,500,000 represents dry goods. The total imports since January 1 are \$186,099,202, as against \$222,681,429 for the corresponding period last year. The exports of produce and merchandise last week were \$56,332 below those of the previous week, the total valuation, exclusive of specie, being \$6,915,587, making an aggregate of \$166,819,046, as compared with \$151,936,797 for the same time last year. According to the Custom House reports the exports of specie from this port during the week amounted to \$344,023, nearly all in American silver, making a total of \$14,718,726 since January 1, and the imports of specie were \$58,099, making a total of \$6,661,134 since January 1.

Preliminary estimates regarding the public debt fix the reduction for the month at \$10,500,000, and for the entire fiscal year at \$65,000,000. The reduction last year was \$101,000,000.

## Metal Market.

Copper.—Sales for the week have been restricted to small lots at the following quotations: Lake Superior, 11 1/4¢ @ 10.05 @ \$10.10 bid for larger lots; Electrolytic, \$11 @ \$11.20; Arizona, 10 7/8¢ @ 11¢, and Baltimore, 10 1/2¢ @ 10 3/4¢. The Calumet and Hecla alone received during the month of June 5,600,000 lb, while the entire June export did not exceed 2,000,000 lb. London has been irregular, but the tendency in Chili Bars is toward higher figures. The quotations were: June 25, £44. 2/6; June 26,

£44. 5/; June 27, £44. 15/; June 29, £44. 12/6; June 30, £44. 7/6, and this morning, £44. 12/6, and Best Selected, £49. The cable tells us that the cholera is spreading in Spain in all directions; should it reach Huelva, the shipping port of the Rio Tinto and other Copper and Pyrites, it would temporarily put a stop to shipments thence, and the London Chili Bar speculators for a rise would avail themselves of this incident to resume operating for an advance. Manufactures may be nominally quoted: Bottoms, 18¢; Braziers, 17 1/4¢; Sheathing, 16¢, and Bolt Copper, 18¢. We are cabled from London this morning that there is no change in the Coffee market.

Tin.—London has weakened, and comes £94 for spot, and £90 for three months, while in this market the attitude of the trade has been one of expectancy and abstinence at 21 3/4¢ for large lines Straits Tin, with a dull feeling toward the close. It is amusing, now that the London and Hamburg mails up to June 20 reach us, to notice how the advance in Tin in the London market was engineered and carried to fever heat. In our last two issues we showed that the visible supply on this side was represented to be only one-third on June 1 of what it really was. On June 20 one of the London papers states: "We hear that the British companies in the Straits cannot work at profit, cannot conduct their operations at anything approaching the meeting of costs, and that the ultimate result must be—if it has not actually occurred in some instances—the disappearance of all the money subscribed." All we have to say is that when, seven years since, Straits Tin declined to £53, and remained below £70 for years, none of the British companies ever complained that they made no money, and that consequently there is nothing to prove that they cannot exist, since Tin ranges above £80. Further on: "From Australia intelligence comes that many sets have been abandoned, and this betokens a diminished supply from that part of the world." From all that people in the metal trade in New York have been able to ascertain it appears that it costs only £36 to produce Tin in Australia. We next find a passage reading thus: "Telegrams from America state that over £102 per ton has been paid there for Straits Tin." Now, it so chances that at no time did our market advance in June above London parity, and the highest figure reached in the latter market was £97. Even the fact that a steam dredge got stuck in the Suez Canal was taken hold of by the London Tin speculators, although in reality it amounted to very little, for M. de Lesseps got the obstacle, if not removed at once, at least promptly circumvented. Whenever speculators for a rise in Europe are at a loss for an argument favoring their views, they will take hold of something that will escape immediate control, because at a distance. They almost invariably resort to American statistics and consumption till the truth leaks out on arrival of the mails. As for consumption of Tin on this side, we can only repeat what the statistics have shown for over a year past—i. e., that this country only consumes about one-half of what it used to consume in former years, because the metal is too dear. The ensuing cablegram is received by us from London: "Market a little weaker, without quotable change in prices."

Tin Plates.—Makers are still asking 3d. per box advance, but have not yet been able to establish it; meanwhile our market has been moderately active on the spot, and inactive in futures, for which an advance is asked, but not yet obtained. The general tendency is a firm one. We quote at the close, ordinary brands, per box: Charcoal Bright, \$4.75 @ \$5; do. Ternes, \$4.40 @ \$4.50; Coke Tin, \$4.30 @ \$4.40, and do. Ternes, \$4.12 1/2 @ \$4.25. Liverpool cables Coke, 13/6, and Charcoal, 16/ @ 18/. From London we are told that the market is firmer, and that manufacturers are considering a proposition to restrict production 25 % for an indefinite term.

Lead.—The party having the Lead market temporarily under control advances his prices gradually, and this is also the case out West, but there would be a sudden break, very likely, were present manipulators to attempt partially ridding themselves of their accumulated holdings, as there is lack of consumptive demand. The sales have been 300 tons Common Domestic at \$3.85; 200 tons St. Joe's at equal to \$3.87 1/2 here, and 150 tons Common at \$3.90. The asking price at present is 4¢, but not over \$3.90 is offered. Refined is nominally \$3.72 1/2. In London Soft Spanish gave way from £11 to £10. 17/6. Manufactures are quoted as follows: Lead Pipe, 5 1/2¢ per lb; Sheet Lead, 6 1/4¢; Tin-lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York, 3¢ per lb. Shot, Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ per lb extra. Our cablegram from London states that the market is quiet.

Spelter and Zinc.—The situation remains featureless and unaltered on the basis of 4 1/4¢ for Common Domestic, and 4 3/4¢ for Silesian. The latter declined in London from £13. 7/6 to £13. 5/. Bertha Refined is quiet at 7 1/4¢ @ 8¢, and Sheet Zinc, without much doing, at 4 1/2¢ @ 5¢ Domestic. We are cabled from London that the market is unchanged.

Antimony.—Has been quiet at 9 3/4¢ for Cookson, and 9 1/2¢ for Hallett, with London unchanged—£38 for the latter.

## St. Louis.

St. Louis, Mo., June 29, 1885.

The most noteworthy occurrence in manufacturing circles during the past week has been the visit of Ohio capitalists and the negotiations for leasing the plant of the St. Louis Ore and Steel Company known as the Vulcan Works. It is believed that the building and operation of the two Steel plants in Belleville, in connection with resumption of work at the Vulcan, will have the effect of arousing interest in Iron and Steel manufacture in this State, and thereby give fresh impetus to other works now idle. In tradematters there is nothing special to report, the dull condition being common to this season. During no previous year since the settlement of the scale of wages by Pittsburgh became an important factor in the Iron trade has the conclusion had so little effect on this market.

Merchant Iron.—The advance of \$2 per ton made by some operating mills has not been followed since the settlement of the scale of wages in Pittsburgh. The average price at stores is about \$1.80.

Hardware.—Trade is quiet. The probable resumption of the Nail mills will check a contemplated advance in Iron Nails. Steel Nails are in good demand. Prices remain about the same as last reported. It has been remarked that the use of Gasoline Stoves is far greater in the West than the East, and the litigation now beginning in the United States Court of this district promises to rival that of the Barbed-Wire patents.

Barbed Wire.—From the operation of factories it is evident that there is a decided scarcity of orders, and prices are seriously affected by the sales of Wire held as collateral security. Still, the quantity now held by warehouses is not so large as during June, 1884, and, in view of efforts being made, it is probable that the stock now on hand will be disposed of before interfering with regular prices for fall trade. On the 27th inst. Judge Treat extended the time for taking testimony for both parties in the suit of Washburn & Moen Mfg. Co. vs. Stevens Fence Company et al. to September 1. The latter company have made only Glidden Wire. Prices are, of course, weak, like the demand.

Lead.—Prices asked in the beginning of the week (\$3.75 for Refined and \$3.70 for Common) were not maintained, and sales at \$3.65 for the Refined and \$3.60 for the Common are reported. Local buyers are "holding off so that prices may find their level."

Wire.—The bulk of the Wire sent to this market being for the use of Barbed-Wire factories, trade is affected by the conditions of their business. Late prices have been decidedly confidential, and for Wire now in warehouse cash buyers can obtain advantageous prices.

W. H. SHIELDS, 313 Olive street, St. Louis, reports as follows, under date of June 29, 1885: There is a better feeling in general, and Bessemer Irons are just a little stiff, owing to the anticipated starting up of the Vulcan Steel Works:

CHARCOAL FOUNDRY.	
Missouri	\$14.50 @ \$17.00
Southern	17.00 @ 18.50
COAL AND COKE FOUNDRY.	
Missouri	14.50 @ 17.00
Southern	15.00 @ 17.00
American Scotch	17.00 @ 20.00
MILL IRON.	
Missouri	14.00 @ 14.50
Southern	13.50 @ 14.00
CAR WHEEL AND MALLEABLE.	
Southern	22.00 @ 25.00
Lake Superior	21.00 @ 24.00
SCRAP.	
Old Car Wheels	14.50 @ 15.00
Old Rails	17.00 @ 17.25

## Detroit.

CHARLES HILBROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of June 29, 1885, as follows: Our Store manufacturers have all been at the convention during the past week, and the subject of Pig Iron, prices thereon, &c., will have been fully discussed, and, if their meeting shall have produced a better feeling, perhaps the sharp edge of hard times may be somewhat blunted, and manufacturing in their line become better. We notice that those consumers who thought the European trouble would culminate in war, and who bought at that time rather largely, are now asking in some cases for "storage room," or that the furnaces hold shipments, or even endeavoring to cut down their orders, and in no cases that we have heard from, where purchases for monthly deliveries have been made with option given for larger delivery, have these options been taken. There has been positively no improvement in Gray Iron here during the past week. Since the disagreement between the mills and the workmen we have received numerous offers for old Rails; the mills, however, are unwilling to take hold at anything like a fair price. One lot of 900 tons brought \$18.50, cash. Detroit, Mahoning Valley and Pittsburgh seem disinclined to give more. Old Wheels, too, seem numerous, though there are large stocks in strong hands, and outside speculation is more for this class of material than for particular brands of Pig Iron. Pig Iron.—Though not as large as the previous week, the sales for Lake Superior Charcoal have been very good. The Western buyers are beginning to join their Eastern competitors, and realize that they cannot buy cheaper than now. For round lots on four months' time we present the following:

Standard Brands L. S. Charcoal,	\$19.50 @ \$20.00
Nos. 1, 2 and 3	20.25 @ 20.75
Standard Brands L. S. Charcoal,	20.25 @ 20.75
Nos. 4, 5 and 6	18.50 @ 19.00
Lake Superior, All Ore	18.50 @ 19.00
Lake Superior, Under Mixed	16.50 @ 17.00
Standard Ohio Black Band	18.50 @ 19.00
Southern No. 2	17.00 @ 17.50
Southern Silvery, Open	18.50 @ 19.00
Southern Silvery, Close	18.50 @ 19.00
Jackson Co. (Ohio) Silvery	18.25 @ 18.50
No. 1 Southern Mill	15.00 @ 16.00
Old Iron Rails (American)	19.00 @ 19.50
Old Wheels	15.75 @ 16.25



# Trade Report.

## New York Iron Market.

**American Pig.**—The week has been an exceedingly dull one, sales being very light. If there were any prospect that a lowering of quotations would induce buying on a more liberal scale, it is likely that the leading companies would name lower figures. But it is justly urged that such a course would not stimulate purchases. There has been considerable comment at the low figures at which Neshannock, a part Cinder Iron is being offered. We quote standard brands of Lehigh and North River Irons, tidewater delivery, as follows: No. 1 X Foundry, \$17.75 @ \$18.50; No. 2 X Foundry, \$16.50 @ \$17.50; Gray Forge, \$15.25 @ \$16; the outside figure is asked for special brands. Outside brands sell for 50¢ @ \$1 less than our quotations.

**Scotch Pig.**—There is not the slightest change in the character of the business. Nominal quotations for 5 and 10 ton lots are as follows: Coltness, \$21 to arrive; Gartsherrie, \$21 to arrive; Shotts, \$21 @ \$21.50 to arrive, \$22 from yard; Carnbroe and Glengarnock, \$19 @ \$19.50 to arrive; Summerlee, \$20 to arrive; Dalmellington, \$19 to arrive; Eglinton, \$18 to arrive; Clyde, \$19 to arrive. Concessions are made for larger lots and for sales from dock.

**Bessemer Pig and Spiegeleisen.**—There are some inquiries in the market for Spiegeleisen, aggregating about 3000 tons. Buyers' views are, however, generally too low for business. We quote: Foreign Spiegeleisen, 20%, remains nominally \$25 @ \$25.50, 10% @ \$21.50 @ \$21.75, 45% @ \$42, 60% @ \$52.50, and 80% @ \$70.50. Foreign Bessemer is nominally \$19 @ \$19.25. American Bessemer Pig is dull and weak. We quote nominally \$15, \$16 and \$17 for Nos. 1, 2 and 3, respectively, at furnace.

**Bar Iron.**—The market is in a stagnant condition and the slightest effort to place Iron leads to an irregularity in prices. The building trade is taking but little Bar Iron, and other buyers take only for pressing requirements. We quote for delivery here, in round lots: Common Iron, 1.45¢ @ 1.55¢; Medium, 1.55¢ @ 1.65¢; and Refined Iron, 1.7¢ @ 1.9¢, the lower figures being occasionally shaded. Store prices are 1.6¢ @ 1.75¢ for Common, 1.75¢ @ 1.8¢ for Medium and 1.85¢ @ 2¢ for Refined. Swedish Iron is quoted \$70 a ton, and Imported Nail Rods at \$77.50 @ \$81, ex-ship, according to quality, in large lines.

**Structural and Shaped Iron.**—Beyond a moderate volume of small current orders nothing has been done. Angles may be quoted nominally 1.9¢ @ 2.1¢, delivered, for round lots, and Tees at 2.1¢ @ 2.25¢. Store quotations remain 2.3¢ @ 2.4¢ for Angles, and 2.5¢ for Tees. American Beams and Channels are 3¢ from dock for all orders. Foreign Beams, in round lots, are quoted 2.5¢ @ 2.6¢ for Belgian, and 2.6¢ @ 2.8¢ for German.

**Plates.**—The market has been quiet, and prices are irregular. A round lot of Steel Plates will probably be closed at an early date. Usual prices for small lots of Iron Plates are as follows: Common or Tank, 2 @ 2.1¢; Refined, 2 1/2¢ @ 2 3/4¢; Shell, 2.4¢ @ 2 1/2¢; Flange, 3.4¢ @ 3 1/2¢; Extra Flange, 4¢ @ 4 1/4¢, with concessions for large lines. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2 1/4¢ on dock; Boiler, 3¢ @ 3 1/4¢ for Shell, 3 1/2¢ @ 4¢ for Flange, and 4¢ @ 5 1/2¢ for Extra Flange and Fire-Box.

**Merchant Steel.**—Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7 1/2¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2 1/4¢ @ 2 3/4¢; Open-Hearth Machinery, 2 1/4¢ @ 2 1/2¢; and Bessemer Machinery, 2 1/4¢ @ 2 1/2¢; English Tool, 13 1/2¢ @ 15 1/2¢.

**Steel Rails.**—With the exception of small lots, nothing has been done. There are a number of inquiries in the market for summer delivery which it is not an easy matter to place satisfactorily. For fall delivery a few lots are coming into market and will probably be sharply contested for. There are some inquiries, too, among them one of 12,000 tons for an Eastern trunk line which may be withdrawn. Offers from the West are very low. We quote nominally \$27 for standard section; 30-lb Rails are quoted at \$30 at tidewater, with some business doing.

**Steel Wire Rods.**—Importers are assuming a firmer attitude, and the lowest figure now quoted by them is \$39.75 @ \$40. They state that the cheap sellers here are out of the market, and that those mills in Germany which were willing to book orders at \$5.10/ are filled up, leaving those mills alone in the market which have all along declined to sell for less than \$5.14/ @ \$5.16/. Importers, therefore, claim to be unable to replace Rods at less than \$39.75 @ \$40, and that figure is the lowest now asked. There has been no increase in the demand here, and buyers are not expected to come up to sellers' views very quickly. The market for Plain Wire is certainly not in a very satisfactory condition. We hear of a recent sale by an Eastern mill to a manufacturer at Joliet, Ill., for 2 1/4¢, delivered. In the

midst of a dull season Wire-makers will not, therefore, be eager buyers of Rods. The only sale reported this week is a lot of 1000 tons at private terms. One of the arguments advanced for higher prices is that the German mills are about to form a pool, with one selling agent for lots destined to this country. We quote \$39.75 @ \$40, nominally.

**Old Rails.**—We hear of no business worth reporting. The best offers are \$16, while \$16.50 is generally asked, which we quote nominally.

**Scrap.**—The market is extremely dull, with little demand and a very moderate supply. The only transaction reported is the sale of a lot of 100 tons of Choice American No. 1 at \$18.50. We quote nominally \$18 @ \$18.50.

**Old Wheels.**—The best bids are \$15.

**Rail Fastenings.**—The Spike manufacturers have completed the details of a combination which is to go into effect in a few days, the selling price being fixed at 1.85¢. Quotations for large lots are 2.55¢ @ 2.65¢ for Bolts and Square Nuts; 2.75¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.55¢ @ 1.7¢ for Splice Bars. Railroad Spikes are quoted 1.85¢ @ 1.9¢. The Chicago, Burlington and Quincy Railroad is reported to have ordered 5000 Steel Angle Bars, specifying .18 to .2 Carbon Steel, which will be made at the Homestead Works.

Messrs. John W. Quincy & Co., 98 William street, New York City, have been appointed sole agents for the Salisbury Charcoal Pig Iron Company. The furnace, originally built in 1825, was burned a few years since, but now, rebuilt, is located in the famous and well-known "Salisbury Ore" district, from which Ores the furnace product is exclusively made. The Iron being carefully graded, it is quite necessary for consumers to note the chill of the different grades, so that when ordering they may be supplied with the grade which will be adapted for uses required. Messrs. Quincy & Co. are now prepared to take orders for carload lots and upward for present or future delivery, and can make prices f.o.b. cars at furnace or at such points as may be designated by their customers.

## Metal Exchange.

The following transactions are reported:  
FRIDAY, JUNE 26.  
10 tons Tin, September.....\$0.1065  
5 tons Tin......107

## Philadelphia.

Office of The Iron Age, 220 South Fourth St.,  
PHILADELPHIA, June 30, 1885.

**Pig Iron.**—The first half of 1885 is closing upon one of the dullest periods ever experienced in the Iron trade. The last half of 1884 was dull, but the past six months have been still duller. Prices have not varied notably, although sales would doubtless show a decline if an average could be obtained on all transactions that have been made. It is interesting to notice the changes since 1878, at which time Pig Iron sold at the lowest prices on record, the average for the year being \$17.62 1/2 at tide for No. 1 Foundry, the lowest for any one month having been \$16.50. The average for 1879 was \$21.50; for 1880, \$28.50; 1881, \$25.12 1/2; 1882, \$25.75; 1883, \$22.37 1/2; 1884, \$19.87 1/2, and for the first half of the current year, \$18. It should be remarked that during the first half of last year the decline was only 50¢ per ton, and during the last half \$1.50 per ton. Nominally there has been no change in 1885, but, as already stated, a good deal of shading has been done, and it is not unfair to assume that a loss of 50¢ has been made within the past six months. It is difficult to determine how the last half of 1885 will compare with the year previous, when a loss of \$1.50 per ton was sustained, but there is too much reason to fear that it will not be totally dissimilar, although perhaps not to the same extent—first, because there are already more sellers than buyers; second, because the tendency is already slightly downward; third, because the accumulations likely to be made within the next 30 days will depress prices still further, and, fourth, because there is no immediate prospect of consumption increasing to a degree likely to cause any demand greater than we have had during the past six months. For these reasons, therefore, it seems quite likely that, low as prices are, they will have to go still lower before the turning point comes; but it does not necessarily follow that they will remain down. In 1878 (the lowest) \$16.50 was touched in October, advanced to \$17 in November, \$17.50 in December, in the July following to \$19.25 and in December to \$30. There is no reason to suppose that prices will fluctuate to any great extent at present, but it is not improbable that a reaction may come toward the close of the year, particularly if there is any decline in the meantime. As already stated, present indications lead to the impression that, low as prices are, they may go off a trifle further. The supply of Pig Iron is certainly in excess of demand, and the most careful inquiries fail to discover any probability of an outlet beyond what there has been for several months past, so that in the very nature of things prices must sag down until supply and demand are brought into more harmonious proportions. The most important interests in the country are in an extremely depressed condition, and while

there is no doubt that improvement is only a question of time, it is equally certain that at the moment there is not the slightest indication that the turning point is near at hand. The railway interests, the most important of any in the country, cannot be regarded as in a very flourishing condition, and there is too much reason to fear that no change for the better can be expected for the present. The many interests closely identified with railways must suffer in proportion. Builders of Cars, Locomotives, Machine Tools, Rails and others equipments, suffer a loss which extends into countless avenues of trade, and, while it would be far more agreeable to report a different condition of affairs, every intelligent person in the trade knows that the above is a fair statement. The one cheerful feature is that the end is coming nearer every day, and that in times past the reaction has come when least expected, and always started from a basis of low prices. In fact, the present position of affairs is so nearly like that in 1878 that it would be hazardous to say that it will not be followed by an improvement similar to that in 1879, although perhaps in a more limited degree. In the meantime there is a general disposition to wait developments, so that, timid as buyers are now, they stand ready to change their position on the first indication that it will be safe for them to do so.

**Manufactured Iron.**—The course of the market during the past six months has been singularly uneventful. No notable changes have been made in either direction, but there has been so much cutting that quoted prices have given very little idea of the actual condition of the market. Good sized orders have been bid for without much regard to quotations, and mills needing work would make a price according to the desirability of the order as to quantity, specifications, delivery, &c. As a rule, the anxiety for business has been steadily increasing, with the natural result of lower prices and less work on hand than ever. It cannot be said that there has been a special decrease in consumption, but the orders have been small, and the mills nearly always close to the end of their contracts, causing an uncertainty in regard to the future which has been very discouraging. At the moment there is nothing upon which to predicate any material change in the position. There is a little more doing among Bridge-builders, but, apart from that, large consumers report the outlook as very uncertain. Shipbuilders are doing comparatively nothing; Car and Locomotive builders are not much better off, while the large machinery establishments are barely able to maintain half to two-thirds time. Under these circumstances it is difficult to see how any improvement in the finished-iron trade can be expected, so that the probability is the present condition of affairs will continue some time longer. As already stated, there has been a considerable amount of business in one way or another, but it has never been done in a more unsatisfactory manner. Orders irregular and uncertain, prices constantly shrinking, until it has become almost impossible to get a new dollar for an old one. The year opened with the Best Refined Bar Iron at 1.8¢, and Plates and Angles at 2¢, and while these quotations are still retained nominally, it has been impossible to make sales in quantity without cutting rates at least 1¢, or from that to 2¢, per ton. On the whole, therefore, the outlook is not very cheerful, although the hope is expressed that after the holidays things will brighten up. Inquiries are a little more numerous, and in some departments the mills have more work on their books than they have had for several weeks. Stocks are light everywhere, and, once buyers become convinced that the turning point is at hand, there will be no scarcity of orders.

**Steel Rails.**—The same monotonous report applies to this interest, as to most others in the Iron trade. Prices have not varied more than 50¢ per ton, perhaps not that in many cases. Quotations vary according to size of order, time of delivery, terms of payment, &c., and, while prices have seemed to have advanced a little, it was because of the character of the orders, more than to any special change in the market. Large lots were quoted \$27 in January, and they can be bought at that to-day, perhaps a shade less, on a strictly first-class order. The demand has been less than was expected, and, as the season advances, prospects have not improved. Prices cannot be much lower in any case, as \$27 is less than cost to some of the mills, and leaves no profit to the best-managed and best-equipped concern in the country.

## Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue,  
PITTSBURGH, PA., June 30, 1885.

There has been nothing particularly important developed in the general situation during the past week; business continues dull. It is the custom with a good many firms to shut down on the 1st of July to take stock and make repairs, and it is not likely that this custom will be departed from. In regard to the fall trade there is a diversity of views; some talk hopefully, while others are despondent. The general outlook is not very encouraging; it is probable there will be an increased demand, but the prospect for an improvement in prices is anything but favorable. The work of putting down Pipes for natural gas is still being pushed forward with considerable energy in both cities. The water-works of Allegheny City, have done away with Coal and put in the natural gas, and a test having been made shows a great

saving thereby to the city. If the gas does not give out, and there is not much danger of this, the probability is that the consumption of Coal will be very much reduced within the next year or so. The Mt. Nebo oil district, some 5 or 6 miles west of Pittsburgh, is attracting a good deal of attention. The great oil belt has been drawing closer and closer to Pittsburgh for some years past, and the probability is that oil derricks can be viewed from our hill tops within the next year or so. Efforts are being made by a number of the Iron manufacturers west of Pittsburgh, which includes the Mahoning and Shenango valleys and Cincinnati, to form an organization of their own. They claim that they have not been fairly treated by the Iron men of Pittsburgh. It is the intention to pay about the same wages that are paid here, with the exception of the Sheet-mill clause. It is stated that some of the mills in the Mahoning Valley will start up shortly with non-union workers. The Sheet-mill Ironworkers, it is said, will have a conference with the manufacturers this week; they will continue to demand present wages.

**Iron Ore.**—There is no improvement in the Ore trade, so far as Pittsburgh is concerned; but a small percentage of the furnaces are in blast, and the idle ones are not likely to be started up as long as the Pig-Iron market remains in its present condition. There is no good reason apparent at present why consumers should anticipate future wants, and, this being the case, the demand will no doubt continue to be of a hand-to-mouth character. Reports from Cleveland report the Lake Ore trade very dull.

**Pig Iron.**—There has been an increased volume of business the past week, but there are no buyers except consumers, and the latter, as a rule, refuse to buy beyond immediate actual wants. Producers generally are just as indifferent about selling. There may be a change for the better in the near future, but the outlook is not favorable for any improvement in price. Included in the sales reported during the week was a lot of 1000 tons Gray Forge Neutral-native Ore—at \$14.50, cash, and several small lots of the same at from \$14.25 to \$14.75, four months; All-Lake Ore Forge at \$16.25, four months; Neutral do., Cinder Mixture, at \$15, four months; White at \$13.50, cash; Cold-Blast Charcoal, \$26.50, cash. No. 3 Bessemer Iron is offered as low as \$16, cash, without finding buyers. Quotations for various grades may be fairly given as follows:

No. 1 Gray Forge.....	\$15.25 @ \$15.35, 4 mon.
No. 2 Gray Forge.....	14.50 @ 14.75, 4 "
All-Ore Forge.....	15.75 @ 16.25, 4 "
White and Nottled.....	13.50 @ 14.00, 4 "
No. 1 Foundry.....	17.00 @ 17.50, 4 "
No. 2 Foundry.....	15.00 @ 15.50, 4 "
Foundry, Charcoal.....	21.50 @ 22.00, 4 "
Cold-Blast Charcoal.....	25.00 @ 27.00, 4 "
Bessemer Iron.....	17.50 @ 18.00, 4 "

Our quotations for Bessemer Iron are based on small lots. It is probable that a round lot of No. 1 could be had 25¢ @ 50¢ per ton below prices quoted, but there appears to be no demand except for small lots.

**Muck Bar.**—There have been no sales reported for several months, in the absence of which it is impossible to give reliable quotations.

**Manufactured Iron.**—Trade in all kinds of Finished Iron continues light, and, notwithstanding the wage scale has been disposed of for another year, some of the mills have not yet started up, and very few of those in operation are running up to their full capacity. A number of the mills now in operation will shut down early in July to take stock and make repairs. Prices are still quoted on a basis of 1.65¢ @ 1.75¢ for Bars, 60 days, 2¢ off for cash. Our quotations are for first-quality Iron. Poor stock can be obtained considerably below prices quoted, but many buyers are willing to pay the difference for first quality.

**Nails.**—The strike still holds out, and there is no more prospect of it being brought to an early close than there was a week ago; both sides appear determined, and it is evident that neither will give way as long as it can be avoided. With considerable inquiry and light stocks prices continue firm, and a further advance within the next few days is not improbable; very few of our manufacturers have an assorted stock, and in order to fill orders are obliged to buy and borrow from each other, and the same is true of Wheeling. Advances from Chicago, Milwaukee, St. Louis and other points of distribution West report stocks in hands of jobbers as being light and badly broken. In the present condition of affairs large orders are not being solicited; manufacturers are making an effort to supply the immediate wants of their regular customers, and, as already noted, they have to borrow and buy from each other to do this. Prices are quoted firm at \$2.10, 60 days, 2¢ off for cash, and the probability is that they will be advanced to \$2.15 within the next few days.

**Wrought-Iron Pipe.**—There has been an improved demand the past week, but there is still room for further improvement, particularly as to prices, which are unchanged, but steady. Discounts on Black Butt-Welded Pipe, 45 @ 50¢; Galvanized do., 35 @ 40¢; on Black Lap-Welded do., 65 @ 65 and 5¢; on Galvanized do., 45 @ 50¢. Selected Pipe, or Pipe cut to specified lengths, discount 5¢ less than rates above quoted. Discount on Boiler Tubes, 60¢. Two-inch Oil-well Tubing, 10¢ per foot, net; 5 1/2-inch Oil-well Casing, 36¢ per foot, net.

**Steel.**—The Merchant Steel trade continues devoid of any important features; de-

mand only fair, while prices remain unchanged. Best brands of Refined Cast Steel, 8 1/2¢; do. Crucible Machinery, 4 1/2 @ 4 3/4¢; Open-Hearth and Bessemer do., 3¢. Owing to the Nail strike there is but little inquiry for Nail Slabs, but prices remain unchanged, being quoted at \$29 @ \$30 per ton.

**Old Rails.**—There have been no sales of Old Iron Rails reported for some time, in the absence of which it is difficult to give reliable quotations. The market is dull and prices are weak, but, so far as we can learn, there is no great pressure to sell. One of our brokers says he has an offer to buy Old Iron Rails at \$18.50, but can find no sellers under \$19; on the other hand, we hear of rumors of offers having been made to sell at \$18. Old Steel Rails dull and nominal at \$16.50 @ \$17, according to lengths.

**Steel Rails.**—The market for New Steel Rails is firmer, and heavy sections for immediate or near-by delivery may be quoted steady at \$28, cash, at mill. A desirable order for delivery in the fall or winter might be taken at 50¢ @ \$1 per ton below price quoted. The report given currency to by one of the daily papers here last week, that the Edgar Thomson Works had closed a contract for 10,000 tons with a certain Western railroad, is contradicted pointedly by those in a position to know; no such sale was made, nor was there any inquiry from the road in question for Rails.

## Chicago.

Office of The Iron Age, 86 and 88 Clark St.,  
Cor. Lake St., CHICAGO, June 29, 1885.

**Hardware.**—The demand during the week was very fair, but something less than during the two weeks previous. The system of buying in small lots is doing very much toward distributing the trade more equally through the year. Jobbers are kept more regularly employed, and are less frequently overworked at one period and idle at another. There have been no special occurrences either in price or condition of trade, and in this direction the market has been undisturbed at prices ruling during the previous week. An error occurred in our last quotation on Flat Head Screws; jobbers' discount to the trade is 85¢ off, and not 80¢, as stated in our last report. Prices, which were irregular recently, have been rather steady, with indications that Cartridges will meet with a further decline in this market at an early date. The cause for this may be found in the statements that lower prices are reported from various portions of the country, and inquiries from buyers for Cartridges at 5¢ better than prices made by Chicago houses come from points so remote as Virginia, Kentucky and Ohio—a trade which is not at all tributary to Chicago, and to which goods are largely shipped from other markets. These parties state that they can buy cheaper than association prices, which is a strong indication that jobbers have offered to sell at less figures than those which have thus far been announced in this market, and leads to the assertion that St. Louis houses have instructed their traveling men to sell Cartridges at 5¢ below any Chicago price that they may find. From this it would appear that there may yet be considerable rivalry in the cutting of prices between these two cities. Hay Forks, Grain Cradles and other Steel goods have come to the front, and some increase has been noticed also in the demand for Carpenters' Tools. Shelf goods of new designs and patterns are being inquired for more freely, with sales slightly improving.

**Barb Wire.**—There is nothing of importance to note in the Barb-Wire market. Business continues very active in small lots; in fact, it is considered remarkable that there should be so much Wire sold at this season of the year. Nearly all mills making Barb Wire are running full time, which is an unusual occurrence for the month of June. Among these sales it is seldom that a carload lot is called for, and it is believed that the Wire is going directly into consumption. It is reported that manufacturers are not a unit as to advancing prices, and, therefore, further action has been dispensed with until the opening of fall trade. The ruling prices for Wire are the same as quoted last week, which are 3.6¢ for Two-Point and Four-Point Painted Cattle Wire, and 3.7¢ for Two-Point and Four-Point Painted Hog Wire, with the additional 1¢ for Galvanized. The market has a semblance of regularity on all first-grade Wires, and concessions, if made, are done so quietly that they have not come to notice.

**Nails.**—There is very little change to note. Iron Nails continue to be quoted at \$2.30 per keg to all trade. Carload lots are not called for, and would not be sold if they were. Jobbers now consider 10 to 20 kegs of a size a very large order, and if possible, when the size is in short supply, satisfy the customer with a less number for the time being. In small lots the trade has been very fair, but there does not seem to be anything urgent in the demand. Stocks have been so carefully manipulated that they are being consumed with greater regularity and extend over a longer period than it was supposed they would when the strike first began. Steel Nails are rather more active and the demand somewhat in excess of the supply. The demand is for small lots, which are quoted at \$2.40 and firmly maintained. The opinion still prevails that there will be no Nails made in the West before August 1, and, while stocks are







# Trade Report.

## General Hardware.

In the review of the market which is given below our readers will find the announcement of several changes in price. Most of these, it will be observed, are in the way of decline, but it will be noted with satisfaction that some lines are held more firmly. The volume of business shows no material increase, and the general conditions remain substantially unchanged.

### NAILS.

There is a slightly better feeling, and the elements of danger to the market which threatened it last week have for the time being disappeared. The market remains quiet, and buyers thus far show little disposition to take more than is required for their immediate wants, which is not much. Iron Nails on dock are obtainable under \$2 in large lines. From store the nominal quotation is \$2.10 to \$2.15 for Iron Nails, and \$2.25 to \$2.35 for Steel Nails. The condition of the trade in other leading markets is reported elsewhere.

### BARB WIRE.

The market continues quiet, though indications of a slightly better feeling are reported in some quarters. We quote 4.35 cents to 4.45 cents for carload lots of Four-Point Galvanized Barb Wire, 4 1/2 to 4 3/4 cents for small lots. Large lines for export, for which there is a fair inquiry, are quoted 3.9 to 4 cents.

### TACKS.

The Tack manufacturers to-day announce the new prices which are given below, revised discounts throughout being made, and a new and reduced Shoe Finders' list published. The trade are also notified that the quantity discounts or rebates which were offered to customers under their quantity Discount Sheet No. 227, adopted January 1, 1885, will be discontinued on and after this date. The new discounts, which apply to the Hardware list of prices, September 1, 1882, and supplement January 1, 1885, are as follows, with a cash discount as heretofore of 10 and 2 per cent.:

	Per cent.
American Iron Carpet Tacks, all kinds.....	60
Steel Carpet Tacks, all kinds.....	60
Swedish Iron Carpet Tacks, all kinds.....	60
Swedish Iron Tacks.....	60
Swedish Iron Upholsterers' Tacks.....	60
Tinned Swedish Iron Tacks.....	60
Tinned Swedish Iron Upholsterers' Tacks.....	60
American Iron Cut Tacks.....	60
Gimp and Lace Tacks.....	60
Tinned Gimp and Lace Tacks.....	60
Copper Tacks.....	55
Copper Finishing and Trunk Nails.....	55
Cigar Box Nails.....	50
Finishing Nails.....	50
Zinc Glaziers' Points.....	50
Common and Patent Brads.....	45
Hungarian Nails and Miners' Tacks.....	45
Trunk and Clout Nails.....	45
Tinned Trunk and Clout Nails.....	40
Basket Nails.....	40
Chair Nails.....	40
Tinned Capped Trunk Nails.....	40
Looking-Glass Tacks.....	30
Picture Frame Points.....	30
Leathered Carpet Tacks.....	30
Brush Tacks.....	30

For Tinned and Coppered Goods on Hardware list for which prices are not given, add 6 cents per pound.

The Shoe Finders' list, July 1, is as follows, and is subject to the cash discounts of 10 and 2 per cent.:

	Per pound.
Iron Shoe Nails, 4-8 inch and longer.....	45
Iron Shoe Nails, 3 1/2-8 inch and shorter.....	45
N. B. Shoe Nails.....	70
Swedish and Charcoal Iron Shoe Nails.....	70
Zinc Shoe Nails.....	16
Zinc Shank Nails.....	16
Diamond Head Zinc Nails, 2-8 and 2 1/2-8 inch, 20¢.....	16
3-8 inch, 20¢; 3 1/2-8 inch and longer.....	18
Copper Shoe Nails.....	24
Brass Shoe Nails.....	24
Copper Gimp Nails or Tacks.....	44
American Iron Hungarian Nails.	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	14
Cts. 10 11 12 13 14	
Swedish Iron Hungarian Nails.	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	15
Cts. 10 11 12 13 14	
Swedish Iron Hungarian Nails (Fancy Head).	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	15
Cts. 10 11 12 13 14	
Oval Head Shank Nails or Tacks.	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	18
Cts. 10 11 12 13 14	
Hob Nails, Swedish Iron, all sizes, in pound or 1/4 pound papers.	
10 11 12 13 14	
Hob Nails, American Iron, all sizes, in pound or 1/4 pound papers.	
10 11 12 13 14	
Steel Shoe Nails, all sizes, in pound or 1/4 pound papers.	
10 11 12 13 14	
Channel Nails.	
5-8 in. & longer.	17
2 1/2-8 in. 3-8 in. 3 1/2-8 in. 4-8 in. 4 1/2-8 in. & longer.	17
Cts. 10 11 12 13 14	
Shoe Tacks.	
1-2 oz. 3-4 oz. 1 oz. 1 1/4 oz. 1 1/2 oz.	16
Cts. 10 11 12 13 14	
Miners' Tacks.	
3-8 in. 3 1/2-8 in. 4-8 in. 4 1/2-8 in. & longer.	10
Cts. 10 11 12 13 14	
Countersunk Swedish Nails.	
3-8 in. 3 1/2-8 in. 4-8 in. 4 1/2-8 in. 5-8 in. & longer.	18
Cts. 10 11 12 13 14	
Concave and Countersunk Head Brass Nails.	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	24
Cts. 10 11 12 13 14	
Concave and Countersunk Head Copper Nails.	
2-8 & 3 1/2-8 in. 3-8 & 3 1/2-8 in. 4-8 in. & longer.	20
Cts. 10 11 12 13 14	
Iron Gimp Nails.	
3 1/2-8 in. 3-8 in. 3 1/2-8 in. 4-8 in. 4 1/2-8 in. & longer.	18
Cts. 10 11 12 13 14	

Any of the above kinds, Tinned, not specified, 5 cents per pound advance on above prices.

The following price list of Lining and Saddle Nails was adopted June 19 and takes effect to-day. It is subject to a discount of 30 per cent. on the Japanese, and of 40 per

cent. on the Silver, Brass, &c., with the regular cash discounts of 10 and 2 per cent.:

	Per pound.
Oval Head Lining Nails.—2 P. W.	
Silver or Japanese, 2 1/2 to 12 ounce, 75 to 100 paper.....	60
Silver or Japanese, 14 to 24 ounce, 75 to 100 paper.....	70
Silver or Japanese, 2 1/2 to 12 ounce, 100 to 150 paper.....	80
Silver or Japanese, 14 to 24 ounce, 100 to 150 paper.....	90
Brass Lining Nails, 4 to 16 ounce, 100 to 150 paper.....	130
Extra Japanese Lining Nails, in gross boxes.....	130
Extra Plated Metal Lining Nails, in gross boxes.....	80

### SADDLE NAILS.

No. 1, Flat or Oval, Silver or Japanese, 3 to 12 ounce, 100 to 150 paper.....	90
No. 1, Flat or Oval, Silver or Japanese, 14 to 24 ounce, 100 to 150 paper.....	100
No. 1, Flat or Oval, Silver or Japanese, 3 to 16 ounce, 75 to 100 paper.....	80
No. 2, Flat or Oval, Silver or Japanese, 8 to 24 ounce, 100 to 150 paper.....	120
No. 2, Flat or Oval, Silver or Japanese, 8 to 24 ounce, 75 to 100 paper.....	130
No. 3, Flat or Oval, Silver or Japanese, 12 ounce to 1 1/4 inch, 75 to 100 paper.....	120
No. 4, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 100 to 150 paper.....	160
No. 4, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 75 to 100 paper.....	130
No. 5, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 100 to 150 paper.....	180
No. 5, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 75 to 100 paper.....	140
No. 6, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 100 to 150 paper.....	300
No. 6, Flat or Oval, Silver or Japanese, 16 ounce to 1 1/4 inch, 75 to 100 paper.....	160
No. 2, Brass Saddle, 6 to 16 ounce, 100 to 150 paper.....	200
No. 2, Trimming Nails, 6 to 16 ounce, 100 to 150 paper.....	120

### BAND NAILS.

Extra Plated Metal Band Nails, in gross boxes..... 300

Extra Japanese Band Nails, in gross boxes..... 150

Coffin Lining Nails.—3 P. W.

Flat or Oval, Silver or Japanese, 2 1/2 and 4 ounce, 100 to 150 paper.....	100
Flat or Oval, Silver or Japanese, 2 1/2 and 4 ounce, 75 to 100 paper.....	80
Flat Extra Plated Metal, in boxes, 100 to 150 paper.....	300
Flat Extra Plated Metal, in papers, 100 to 150 paper.....	190
Oval Extra Plated Metal, in boxes, 100 to 150 paper.....	300
Oval Extra Plated Metal, in papers, 100 to 150 paper.....	190

Colors on Tufting Nails to match sample, extra on above prices.

### MISCELLANEOUS PRICES.

The manufacturers of Iron Rivets have made a reduction in their price on account of competition from outside makers. The discount on all Common Rivets in bulk or papers is fixed at 50 per cent., and the discount on Block and Carriage Rivets and all other Rivets and Burrs, except as above stated, 45 per cent. A slight change has also been made in the quantity discounts. The American Screw Company, in their circular, July 1, cancel and withdraw all previous quotations on Rivets and quote as above. They also announce that any party purchasing and receiving \$250 worth or more of Iron Rivets and Burrs at the above price during the six months ending June 30 and December 31 will be entitled to an additional discount of 7 1/2 per cent. It is stated also that freight is allowed on Rivets to principal cities on or east of the Mississippi River.

The manufacturers of Strap and T Hinges have to-day made another advance in these goods, making the price discount 65 and 10 and an additional 2 per cent for cash in 10 days. The character of the combination on this line is such that it is expected that the price thus established will be firmly maintained on the part of the manufacturers. The American Screw Company, Providence, R. I., in a circular dated July 1, besides the new quotations on Rivets, which are noticed above, announce a change in the price of Iron Wood Screws, 1/2 inch and smaller, on which, in addition to the discounts heretofore published, an extra 10 per cent. is given. This will be recognized by the trade as a concession in price, on account of the Russell & Erwin list being relatively lower on these sizes than that of the American Screw Company.

The action of the manufacturers of Manila and Sisal Rope is awaited with interest. The pool which has been in existence for some time expires by limitation to-day, and efforts are being made to have it renewed, but there are difficulties in the way on account of outside competition, and some changes in the constitution of the pool will be necessary in order to secure its continuance. If the manufacturers are able to harmonize their views, it is intimated as probable that Sisal and Manila will command higher prices, but if the combination fails they are likely to go lower.

The manufacturers of Coffee Mills will have a meeting before long, and it is intimated as not unlikely that a reduction may be made in the price. We have alluded to the irregularity in the price of Brass Butts on account of jobbers who hold large stocks offering them at less than combination rates. It is, however, rumored that some of the manufacturers are also selling the goods at special figures. The manufacturers of Cast Butts have been in conference to-day, and as a result of their deliberations, there is a stronger feeling and prices are firmer.

Lane Brothers, Poughkeepsie, N. Y., for whom John H. Graham & Co., are agents, 113 Chambers street, New York, announce that on and after July 1, 1885, they offer the Lane Patent Sliding Door Hanger and Track at discount 30 and 10 per cent. from list, the goods shipped from Poughkeepsie or New York City. They refer to the Hanger

as more nearly approaching anti-friction than any other in the market, to the excellence of the material and workmanship, and to the favor with which it has been received by the trade.

The Perfection Saw-Set illustrated among our Hardware Novelties on page 37, and manufactured by John A. Fischer, Covington, Ky., is sold at \$9 per dozen. Mr. Fischer is also manufacturer of the H. & F. Secret Fire-Proof Safe, an Iron fire and burglar-proof receptacle for papers, Silverware, Jewelry and other valuables, of which five sizes are made, ranging in height from 8 to 24 1/2 inches, in depth from 9 to 10 inches, and in width from 4 to 24 1/2 inches.

Edward K. Tryon, Jr., & Co., Philadelphia, have sent out, under date of June 27, the following quotations on the Remington Guns and Rifles as figures at which they will clear out their present large stock of the goods:

Remington Double Guns.	
Thirty and 32 inch barrels, 10, 12 and 16 gauges, 7 to 10 pounds; 10 gauges, 8 1/2 to 10 pounds; 12 gauges, 9 1/2 to 10 pounds; 16 gauges, 7 pounds.	
No. 1, Decarbonized Steel Barrel.....	\$45.00
No. 2, Twist Steel Barrel.....	50.00
No. 3, Damascus Pattern Steel Barrels, Selected Walnut Stock.....	55.00
No. 4, Five Damascus Pattern Steel Barrels, Selected Walnut Stock, Engraved.....	65.00
Discount 40 per cent.	

Remington Sporting Rifles.	
No. 1, Rifle, Sporting Stock, Open Sights, Octagon Barrel 34 to 9 pounds, 22, 32, 38, 40, 44, 45 and 50 cal., R. F. & C. F., 24, 26, 28, 30 and 32 inch Barrels.....	\$18.00
Extra for weights over 9 pounds, each pound No. 14, Rifle, Sporting Stock, Open Sights, Octagon Barrel, 7 to 8 pounds, 22 and 32 cal., R. F. & C. F., 24, 26, 28 and 30 inch Barrels.....	18.00
No. 2, Rifle, Sporting Stock, Open Sights, Octagon Barrel, 5 to 6 1/2 pounds, 22, 32, 38 and 44 cal., R. F. & C. F., 24, 26, 28 and 30 inch Barrels.....	18.00
Extra for each additional 2 inches in length of Barrel.....	1.00
22 caliber are not made longer than 28 inches. Extra for weights over 9 pounds, each pound Extra for each additional 2 inches in length of Barrel.....	1.00
Set Triggers, for Nos. 1 and 1 1/2 Rifles.....	2.50
Double Triggers, for No. 3 Rifles.....	3.00
Discount 25, 10 & 10 per cent.	

The following are the prices of the Coultas Patent Door Holder, which is represented in an advertisement on page 42, and sold by Sise, Gibson & Co., 100 Chambers street, New York, the list being subject to a discount of 40 per cent.:

	Per doz.
Japan.....	\$14.00
Vienna Bronze.....	18.00
Bronze.....	27.00
Brass, Nickel-plated.....	32.00

By this contrivance it will be perceived that the door is held in any position by the pressure of the roller on the floor, and attention is called to the fact that the rubber covering to the roller is for the purpose of avoiding injury to carpets and oilcloths.

The Colwell Lead Company, 63 Centre street, New York, issue to day a price list of Shot, with the intimation that for the greater convenience of the trade they have changed their manner of selling from a price per pound to a price per bag. They quote the following cash prices, subject to discount of 2 cents per (bag) 25 pounds if paid within five days from receipt of bill:

Drop Shot, per (bag) 25 pounds.....	\$1.50
Drop Shot, per (bag) 5 pounds.....	.33
Buck and Chilled Shot, per (bag) 25 pounds.....	1.75
Buck and Chilled Shot, per (bag) 5 pounds.....	.40

It is also announced that in lots of 1000 pounds and upward no cartage will be charged.

From his advertisement on page 33, it will be seen that George B. Curtis, 95 Chambers street, New York, offers a Wrench intended for the use of machinists, tool-makers, amateurs and bicyclists, which is there illustrated and described. It is sold at the following prices: Plain Polished, per dozen, \$3; Nickel-plated, \$4—subject to a discount of 40 per cent.

### ITEMS.

The Russell & Erwin Mfg. Co., in a circular dated July 1, inform the trade that, having purchased the property and machinery of the Dayton Screw Company, Dayton, Ohio, it is their intention to provide material to run the works as a manufacturing branch of their business. The products will be shipped to buyers direct from the works, but the sales will be effected, the accounts kept and the collections made by their New York house.

The advertisement of John H. Graham & Co., 113 Chambers street, New York, which appears on page 8, will be of especial interest to the trade, giving, as it does, the names of some 50 manufacturers for whom they are agents, many of whom will be recognized by the trade as prominent in their respective lines. Looking over the list, it will be seen that a number of new agencies have recently been added, among which may be mentioned that of the American Machine Company, manufacturers of Freezers, Wringers, Fluting Machines, &c.; the North Wayne Tool Company, manufacturers of Hay Knives and the C. C. Brooks Axe; the Lawrence Currycomb Company, manufacturers of Currycombs; B. C. Wheeler & Co., manufacturers of Chucks and Wheelbarrows; W. S. Smith & Co., manufacturers of Measures, &c.; F. A. Reiber & Co., manufacturers of Transom Lifters; the Ingersoll Mfg. Co., manufacturers of Drills; but our readers will be interested in referring to the list, covering an exceptionally important and complete line of goods. We are also advised that they have been appointed agents for the Cronk Hanger Company, Elmira, N. Y., and are prepared to give the manufacturers' best terms on their Wrought-Iron Barn Door Hangers and Stay Rollers, as well as other goods of their manufacture.

The Flagler, Forsyth & Pierson Mfg. Co., 298 Broadway, N. Y., advise us that they have purchased the patent and all the business connected with the well known Bloomfield Door Bell, and will hereafter manufacture the same. They have also secured the services of Mr. Bloomfield, who will superintend the manufacture of the Bell. They allude to the simplicity and durability of this Bell as having brought it into general favor with builders because of its easy adjustment, and with buyers on account of its durability, as there are no springs to get out of order.

From the advertisement which appears on page 12 it will be seen that S. A. Haines & Co., 88 Chambers street, New York, are sales agents for the Richmond "Star" Lawn Mower, on which they are authorized to give the manufacturers' most favorable terms. The dissolution of the firm of H. R. Booker & Brother, Hampton, Va., by the withdrawal of John Booker, is announced under date June 26. The remaining partner, Hunter B. Booker, will continue the business at the same place, and assumes all the liabilities of the late firm, and with him the accounts are to be settled.

Our readers will observe that page 16 is occupied by the announcement which the Francis Axe Company, for whom T. P. Burke is agent, 100 Chambers street, New York, make with reference to their Axes. It will be seen that Hibbard, Spencer, Bartlett & Co. are announced as their agents for the Northwest. The manufacturers advise us that in the production of these Axes they are running full force and are making a specialty of the All-Steel All-Polished Axes, a line in the manufacture of which they refer as giving great care. They speak of them as not only the most satisfactory tool for the chopper, but as affording the dealer a better profit. They also inform us that they have introduced a new method for handling the Axes, which they claim prevents the handles from becoming loose, rendering the goods thus especially adapted for export to warm latitudes.

By a typographical error which occurred in our last issue, among the manufactures of O. F. Swift, Buffalo, N. Y., Hotel Registers were mentioned, instead of Hot-Air Registers, which Mr. Swift is making. Our readers will observe among the Special Notices on page 26 that of the auction sale of the R. Toulinson Spring and Axle Works, Bridgeport, Conn., particulars of the sale, which takes place on Tuesday, July 7, being given. It will be seen that this is an important sale, and one worthy the attention of capitalists and manufacturers.

The Kelsey Cartridge Company, New Haven, Conn., has been bought out and succeeded by the American Buckle and Cartridge Company, of West Haven, Conn., a joint-stock company formed under the laws of the State. The announcement of the Humason & Beckley Mfg. Co. will be observed on page 36, calling attention to their home office at New Britain, Conn., their New York office at 80 Chambers street, and their San Francisco office with A. J. Hall & Son, 528 and 530 Market street. We are also informed that Charles N. Edwards, who is well-known to many of our readers in the South, will represent the Humason & Beckley Mfg. Co., and also Bates, Wilson & Co., in the Southern Territory, and while in this city will make their store, 80 Chambers street, his headquarters.

The death of John Nicholson, of the firm of Nicholson & Galloway, 644 and 646 Hudson street, New York, is announced, and notice is given by Chas. T. Galloway, who has been associated with the management of the business for nearly 30 years, that it will be continued at the above address under the same firm title.

The Zeck Pattern Axe, which is manufactured by Johnson Bros., successors to Johnson Bros. & Leeper, Cincinnati, Ohio, is illustrated in their advertisement on page 42, and attention is called to the claims which are made for it, and the trade warned against imitations which, it is said, have been placed on the market.

The following announcement with reference to the firm of Samuel A. Haines & Co. we take pleasure in laying before our readers:

NEW YORK, July 1, 1885.  
I beg to announce to the trade that I have this day admitted C. M. Hopkins and C. M. Miller to an interest in my business, and that the firm name on and after this date will be S. A. Haines & Co. I take this opportunity to thank my friends for their many favors in the past, and express the hope that this change will be the means of increasing our business transactions.

I am very truly, SAMUEL A. HAINES.  
In this connection we would mention that Samuel A. Haines & Co. have been appointed the sole selling agents of Logan & Strobbridge, New Brighton, Pa., manufacturers of Coffee Mills and a miscellaneous line of Hardware.

Our readers will observe on page 42 an illustration of Frost's Patent Thill Spring, which is manufactured by Stiles Frost, 276 Devonshire street, Boston. It will be seen that every pair is warranted and guaranteed not to rattle.

WHAT THE TRADE SAY.  
The following communication is from the Hardwareman whose letter appeared two weeks ago, in which reference was made to the conflict which he predicts between the manufacturers and the jobbers, in which, in his opinion, the jobbers are sure to get the worst of it. This communication, it will be seen, refers to the same subject, and contains an enlargement of our correspondent's

views on this and kindred questions. Our readers will peruse the letter with interest, and will give weight to its careful review of the situation and the considerations which are referred to as giving the basis for the opinions expressed. The point which is made with reference to the comparative stability in the prices of goods which are not handled by the jobbers is an important one, which we would commend to the careful attention of all parties interested. We leave with manufacturers and our readers at large to say whether or not the point is well taken and sustained by facts:

We believe the "irrepressible conflict" mentioned in our communication recently is a reality. The cause is not hard to find. While the jobbers were able to take and dispose of the output of manufacturers there was no trouble and no occasion for any. But we suppose it is generally conceded on all sides that that time has past some time ago, and, in consequence, manufacturers have stocks that they must dispose of to meet current expenses. And what is more natural than that they should look to the best retail trade for an outlet, which affords not only sale for their goods, but probably at a better price than they have been getting from the jobber? Manufacturers do not go to the retail trade from choice, but from necessity. They tried all possible means to avoid it. They gave jobbers large discounts beyond the printed discounts, and as an extra inducement gave large rebates at the end of the season. How this policy defeated itself has been commented on in your valuable journal a great many times. Sharp competition and anxiety to sell resulted in the jobbers giving the trade all their extra inducements. Perhaps the modern drummer is partly to blame for this. A traveler who can't sell goods is of no earthly use, and in these times, if they all are to sell goods, some inducements must be held out, and these inducements generally include a cut price. If we desire to buy something on which we are uncertain as to what is the best price, we feel very much safer in waiting for a traveler than to send a mail order to the best house in the United States. These same States have enacted laws imposing a large tax or license on commercial travelers, under the impression, I suppose, that it protects their people. This is a mistake and is of the same piece with the other "protection" humbug. We believe the nearer the producer and consumer get together, and the less obstacles you place in the way of the accomplishment of this end, the better. Of what may or may not be obstacles, of course there will be differences of opinion. We presume jobbers are not making large profits, and perhaps some are not making any. Their business is legitimate, and if in the march of improvement they are a necessity they will stay; if not, it will be hard for them to oppose the inevitable. There is one way in which jobbers very seriously injure trade. This is in the matter of credits. They think to gain the everlasting gratitude of a retailer by extending the time on overdue invoices and carrying them along indefinitely, until they are obliged to take a secret chattel mortgage on the stock, and in that way help them along in getting credit with other firms who eventually lose a large part of the whole of their accounts. And when the jobber steps in and takes the stock, as he does in nine cases in ten, he sells it to some "smart Alec" without enough money to buy 10 kegs of Nails, and this chap puts up a new sign, disfigures the fences throughout the surrounding country, and goes through the farce of being the proprietor of an "immense new stock bought for cash." This "wart" on the surface of the trade conducts the business on the same principle by which he acquired it, and makes any selling price and gives any time the customer wants. We fail to see how a person who controls a stock of goods got in this way has interest enough in it to conduct it properly. If the jobbers out West would honestly show up their relations with trade they would exhibit a deplorable state of affairs in this respect. The jobbers are alone to blame for this, and the remedy rests with them. It really amounts to this: The jobbers have a retail store in nearly every town in the country, and they compete with legitimate trade. In consequence, legitimate retailers who own their stocks and conduct their business on a basis that will pay their bills are obliged to look beyond the jobber for prices and protection. We will mention one more matter. The manufacturers of Stoves have never put their goods in the hands of jobbers, and the price of Stoves has not fluctuated 5 per cent. in seven years. A slight investigation will convince any person that the goods usually sold by the manufacturers direct to the retail trade have maintained the best and steadiest prices through the hard times.

RETAILER.  
A Western Hardwareman writes as follows, reviewing the situation as he observes it, and giving, it will be seen, not a very cheerful impression of the condition of the market or the immediate outlook. Our readers will, however, bear in mind that the state of trade at large is not to be judged by the experience of any one locality, and they will recall many instances in which dullness and a general unsatisfactory condition has been succeeded unexpectedly by a decided improvement. Many of our advices, we are glad to add, are more cheerful than that which we give below, but our correspondent refers to several matters of interest, and our readers will take pleasure in reading his remarks:

Everything points to lower prices and less trade. Those who are well in as to funds are of the class who are not buying more than absolute necessities—who are husbanding until money will go even further than to-day, who are of the good farming community that asks for long credit, that they may use their money in loans at high rates. The class of men who ought to pay are those who do not. We live off the poor man, because we refuse him credit, and the rich man's account is held on the books as a sort of reserve fund, which, when called for, will probably be settled by note without interest. These

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are some of the evils of that thoroughly American institution, the credit system, a system which makes the cash buyer pay the merchants losses on bad accounts. Dropping the above, for books might be written on the subject, trade does not revive, nor does it give much indication of anything bright in the immediate future. It is a continual fight between buyers of goods and sellers of goods, which will continue until labor is better paid, until stock runs low, and the necessary advance in prices which always makes quick sales.

## TOWER &amp; LYON,

96 Chambers street, New York, issue their No. 5 illustrated catalogue and price list of specialties in Hardware in a neatly-printed pamphlet with flexible cloth covers. It includes lines of Police Goods, Tools, Padlocks—Scandinavian and Pye's Patent Spring—House-Furnishing Hardware, Miscellaneous Air Rifles, Roller Skates and Le Page's Glue. Department No. 1 is devoted to Police Equipments and Implements for criminal officers, prisons, jails, &c., including Tower's Patent Adjustable Double Lock Handcuffs and Leg Irons and similar goods, among which as a new article may be noticed Tower's Detective Handcuffs, which are described as extra light weight, adjustable, self-locking, secure and strong. These Handcuffs are designed to meet the demand for a very light-weight shackle for those officers, detectives and others who require to have implements always with them, and with whom the saving of a few ounces in the weight is a matter of importance. In this department also are included Phillips's Patent Police Nippers, Tower's "Perfect" Twisters, Chain Police Nippers and other police specialties. Department No. 2 is devoted to tools for carpenters and mechanics, and covers Chapman's Patent Adjustable Iron Bench Planes, which are fully illustrated and described. Among them we notice new Corrugated Bottom Planes, the special features of which are illustrated. The corrugations are divided by a series of ribs through the bottom of the Planes, and are described as giving increased strength without adding to the weight. By this method it is claimed that not only is the demand met for a line of Planes having air chambers to relieve the suction, which is sometimes urged as an objection to Iron Planes, but that at the same time by the parallel ribs added strength and rigidity are given to the tools. The Engineer's Wrench, Donahue's patent, is also described, and Boardman's Patent Combination Wrenches, the "Gem" Pocket Wrench, the "Pet" Screw Driver and Tower's "Champion" Screw Drivers, "Champion" Machinists' Screw Drivers and other tools are illustrated. Department No. 3 is devoted to Padlocks, and covers Brown's Patent Iron and Brass Padlocks, McWilliams's Patent Scandinavian or Jail Padlocks and Pye's Patent Spring Padlocks. In Department No. 4, which represents House-Furnishing and miscellaneous Hardware, the "Crown" Egg Beater is represented and attention called to its special features. The "Columbia" Air Rifle, caliber .70, is described as an elegant and effective Target Rifle that will kill birds at 20 to 30 yards. Its weight is 5½ pounds and total length 42 inches, nickel-plated mountings. The "Harvard" Roller Skates are also represented, and Le Page's Liquid Fish Glues and Mucilage. The following are the discounts on the line of goods represented in the catalogue:

Handcuffs and Leg Irons, Double Lock..... 25  
Leg Irons with Ball and Chain, Double Lock..... 25  
Handcuffs and Leg Irons, Detective..... 25  
Phillips's Police Nippers..... 25  
Perfect Twisters and Chain Nippers..... 25  
Duplex Police Calls..... 25  
Brown's Patent Flexible Police Clubs..... 25  
New Futed Police Clubs..... 15  
Police Belts..... 15  
Police Dark Lanterns..... 15  
Prison Fats, Patent Porcelain Lined..... 10  
Leininger's Patent Shackles..... 10  
Rubber Pocket Pistol Case, Le Page's Patent..... 20  
Chaplin's Iron Planes..... 30  
Chaplin's Iron Block Planes, No. 20, No. 30..... 30  
Chaplin's Iron Planes, Rubber Handle..... 30  
Chaplin's Iron Planes, with Corrugated Face..... 30  
Engineers' Wrenches..... 25  
Boardman's Patent Combination Wrenches..... 25  
Gem Pocket Wrenches..... 25  
Pet Screw Drivers..... 25  
Champion Screw Drivers (Police Clubs)..... 25  
Lambert's Adjustable Clamps..... 25  
Strasser's Combination Hammers..... 25  
Whitney Geared Hand Drills..... 25  
Poele's Patent Safe Capping Tool..... 25  
Scandinavian Charn Padlocks..... 50  
Dog-Collar Padlocks, Cast Brass and Spring Shackles..... 25  
Padlocks, Brown's Patent Brass and Iron..... 25  
Padlocks, McWilliams's Patent Scandinavian..... 25  
Padlocks, Pye's Patent Brass and Iron..... 25  
Padlocks, Red Scandinavian, Nos. 190, 190..... 140  
Padlocks, Red Scandinavian, Nos. 9 to 240..... 25  
Padlocks, Flat Key Scandinavian..... 60  
Lemon Squeezers, Boss and Gem..... 25  
Universal Fork and Lifter..... 25  
Home Broller..... 25  
Can Openers..... 25  
Carley's Combined Lifter..... 25  
Egg Beaters, Crown and Grecian..... 25  
Poele's Patent Adjusting Blind Fastenings..... 25  
Taylor's Patent Cattle Ties and Cattle-Tie Irons..... 25  
Patent Acme Rowlocks..... 25  
Pneum's Patent Thill Tug..... 25  
Air Rifles and Air Pistols..... 25  
Darts and Slugs..... 25  
Patent Flyer and Flying Targets..... 25  
Tarrels for Rifles..... 25  
Harvard Roller Skates..... 25  
Russia Cement Co.'s Le Page's Glue..... 25

## CATALOGUES, ETC.

William Blair & Co., Chicago, Ill., under date June 25, issue a circular to the trade illustrating some specialties, but without prices. It calls attention briefly to the Nail, Sheet Iron, Pig Tin, Copper and Tin Plate markets, and alludes to the scarcity of Wire Cloth, the withdrawal by the Cartridge Association of the restriction upon the selling price, the advance by the makers of about 5 per cent. in Strap and T Hinges, and informs the trade that in Screws the manufacturers have withdrawn their cut prices and are now selling at uniform rates.

The Rock Island Plow Company, successors to B. D. Buford & Co., Rock Island, Ill., issue a neat illustrated catalogue and price

list describing the Buford Sulky and Gang Plows, Riding and Walking Cultivators, Harrows and Shovel Plows and Hand Plows in variety.

The sixth edition of the catalogue issued by the Niagara Stamping and Tool Company, Buffalo, N. Y., comprises three sections, the first being devoted to Tinner's Machines and Tools, including Rolls, Squaring Shears, Cornice Brakes, &c.; the second to Presses and Dies, and the third to Canning Machinery. Altogether there are about 140 pages of attractive letter press and engravings illustrating the various specialties. Several additions have been made to the catalogue since its last issue. Among these may be mentioned Crimping and Corrugating Rolls for crimping and corrugating Sheet Iron No. 22 and lighter; the "Hercules" Squaring Shears, which is described as the only machine in the market capable of cutting No. 15 Iron the full length of the shear in one single cut. It is made of five sizes to cut from 22 to 43 inches. An 8-foot Squaring Shears for cornice-makers is also represented; also the Buffalo "Excelsior" Squaring Shears, and Rotary Slitting Shears Nos. 105 and 106. Among the Presses and Dies in Section B are the Upright Power Presses, Nos. 22 to 25, which the manufacturers are now introducing, and are described as very powerful and adapted for all the various work capable of being done on such a machine. In the department of Canning Machinery the Pumpkin Peeler and Grater and the Niagara Process Retorts have also been added to their line.

The Triumph Winger Company, Keene, N. H., issue an especially neat and tasty catalogue of their Wingers, describing their different styles and the special features of the goods.

## SATURDAY EARLY CLOSING.

We give below the names of a number of prominent firms, mostly in the Hardware trade, who express themselves in sympathy with the early-closing movement, and announce that their places of business will close at 1 o'clock on Saturdays during the months of July and August:

J. Q. Maynard.  
Empire Laundry Machinery Company.  
J. A. Crouthers.  
Union Emery Wheel and Machine Co.  
Stanley Works.  
Giffing & Marvin.  
Bates, Wilson & Co.  
Eagle Lock Company.  
Lamson & Goodnow Mfg. Co.  
Samuel A. Haines.  
Chas. Parker.  
McCoy & Sanders.  
Butler & Constant.  
The Yale & Towne Mfg. Co.  
E. Bissell & Co.  
C. M. Hopkins.  
F. G. Broust.  
H. D. Smith.  
American Tack Company.  
A. Field & Son.  
Schoverling, Daly & Gales.  
Struller, Lau & Co.  
P. & F. Corbin.  
Remington Agricultural Company.  
George Place Mfg. Co.  
Isaac Smith's Son & Co.  
Henry B. Newhall Company.  
Alfred Field & Co.  
The Union Nut Co.  
Durrie & McCarty.  
C. E. Jennings & Co.  
Pope & Stevens.

In addition the following named houses close, but do not deem it necessary to give in their names at present:  
M. E. O'Connor.  
F. B. Gurney.  
Millers Falls Company.  
Hammacher & Delius.  
H. N. Meyers.

Other houses have the matter under advisement and will probably join in the movement, some of them expressing sympathy with it, but waiting until their neighbors or competitors reach a decision.

## Coal Market.

New circulars issued to their customers by the Delaware and Hudson Canal Company, the Lehigh and Schuylkill Exchanges, and perhaps one or two others in the Anthracite trade, make no change in prices. The list of July is looked upon as fixing the date of lowest water, from which there must be an improvement, but no return of activity is looked for before August. The operators reason that the prevailing dullness, which is almost without precedent—the accumulation at tidewater being excessive at several points—augurs an active fall trade. They affirm confidently that any possible advantage to the consumer which may result from delay is sure to be more than offset by the increased cost of transportation later; that there is likely to be difficulty in procuring vessels. That argument however has been repeated every year, and consumers have lost faith in it. Competition in the effort to retain old customers results in some very low prices, although special Coals remain close to the circulars. Steam sizes, such as Chestnut, Pea and Buckwheat, drag heavily. Transactions are about as follows: Broken and Egg, \$3.40, ordinary grades: Stove, \$3.85 @ \$4, alongside; Chestnut, \$3.40 @ \$3.60; Pea, \$2.20. Bituminous sells down to \$2.85, or possibly lower in some cases. With July 1st the quota of production is increased to 2,800,000 tons. Up to the present time, as nearly as can be estimated, only about 12,000,000 tons of Anthracite have been mined, out of about 30,000,000 which are expected to pass into consumption during the Coal year, and the inference is drawn that the large proportion yet to be mined promises

more than usual activity at the close. The total amount of Anthracite mined thus far in the year 1885 is 12,156,394 tons, compared with 12,285,704 tons for the same period last year. The total amount of Bituminous sent to the Eastern markets thus far in the year 1885 is 2,714,335 tons, compared with 2,780,351 tons for the corresponding period last year.

## Foreign Markets.

## FRANCE.

PARIS, June 15, 1885.—Metals.—All subjects of a general character calculated to cause uneasiness, except perhaps the reappearance of the cholera in Spain, having vanished, business has taken quite a start, the more so as crop prospects remain fair. With the exception of Lead which is wanted, and higher, metals have, however, been dull and lower. The following quotations: Copper.—Chest Bars, 114 @ 116.35; Ingots and Slabs, 124; Best Selected, 126.25; and Pure Corrocor Ore, 117.50. Tin, Banca, 237.50; Biliton, 235; Straits, 248.75; Australian, 248.75; and English, 242.25. Lead, 27.50 @ 28.50, and Spelter, 36 @ 37.50 francs per 100 kg. Iron.—The prevalent feature of the iron trade in France has been depression, less so at the blast furnaces than among manufacturers and steel works. The owners of blast furnaces and rolling mills in the Northern Department have now resolved to curtail their output. A comparison of wages paid in the basin of the Loire during the first five months abundantly shows how bad business has been. Thus, this year they amounted to only 10,000,000 francs, whereas last year 16,000,000 francs were disbursed among the men, and 25,000,000 francs in 1883. The decrease in two years has, consequently, been 60%. The Valenciennes meeting is to be followed by a meeting of rolling mill owners at Maubeuge in a few days, when the extent of the curtailment of production is to be determined. Thus, a general reduction will take place in Ardennes and Department of the North and the one held, and in the East on the other. Meanwhile, business in iron has been quiet in this city, prices being rather firmer in view of the above meetings. Coal is dull and barely sustained. —*Moniteur des Interests Matériels.*

## BELGIUM.

BRUSSELS, June 15, 1885.—Iron.—While the domestic demand has developed but little activity, being limited to a steady run of small orders, export orders have been on the increase, notably so for Netherlands India; Roumania is also in treaty for a number of bridges for the Danube. Some 4000 tons of Old Rails sold at 5.82 @ 6.75 francs per 100 kg. Thus as offering Foundry Pig very low, at 4.00 francs, and a difference between the two numbers. Prices have meanwhile not improved, but have been sustained on the whole. As matters stand it seems that Belgian iron industry will be able to bridge over the dull summer spell without difficulty, and without lowering prices further; the latter leave a moderate margin of profit, even those obtained for export, which, under existing circumstances, has to satisfy makers, the prospect being that from now forward the export interruption it experienced during the spring. Following is the foreign trade movement in Iron and Steel during the first four months:

	—Imports—		—Exports—	
	1885.	1884.	1885.	1884.
	Tons.	Tons.	Tons.	Tons.
Iron Ore.....	423,439	508,717	58,768	63,822
Cast Steel.....	5	29	508	8
Steel Rails.....	62	147	158	13,677
Steel in Bars.....	1,084	1,394	929	2,979
Do. Wrought.....	91	116	432	462
Pig Iron.....	27,996	42,436	2,174	1,453
Old Iron.....	7,308	4,292	1,099	4,705
Iron Wire.....	2,058	2,318	567	709
Iron Rails.....	85	244	1,516	5,725
Sheets.....	383	196	9,869	12,845
Merchant Iron.....	1,750	1,729	60,608	68,098
Nails.....	131	106	2,396	1,876
Other Finished Iron.....	1,007	909	7,865	7,292
Castings.....	162	211	4,955	2,422
Total.....	485,566	562,784	167,536	181,121

*Coal inactive and weak.—Moniteur Industriel.*

Coal inactive and weak. —*Moniteur Industriel.*

## GERMANY.

HAMBURG, June 15, 1885.—Iron.—There has been some improvement in the Rhenish-Westphalian Iron trade; a better demand for several articles is noticeable, and in most branches prices have not only been sustained, but have risen. It is to be hoped that the proposed reduction of output may be productive of a sounder state of affairs in the future. Iron Ore has been looking up, notably in the Silesian district, where an advance of 20 @ 40 pence per ton has taken place. Stocks have in part been reduced and production curtailed. Machine shops and foundries might be busier; orders are light and prices unremunerative. Bridge-building concerns, on the contrary, obtain full rates. Car shops are doing as well before. In Upper Silesia there is continued overproduction of Pig Iron, the weekly output being 8000 tons, and the market is dull there at 45 @ 46 marks for Pudding, and 54 @ 56 for Foundry Pig. Foundries are doing less business than they have done for years past at this season; lower prices do not seem to attract orders. Rolling-mill products are doing tolerably well for local use and export, especially Merchant and Thin Sheets; Thick Sheets, less so, there being no demand from sugar-house. Great animation is reported in the Bessemer and Thomas branches; Car Wheels and Hoops are wanted. Railroad material is in moderate demand, and so are Boilers and Locomotives. Lead has shown great firmness in consequence of reduced stocks. We quote: German, 12.70 marks @ 50 kg.; Lake Copper, 58 @ 56; Silesian Spelter, 19.90 @ 14.00 on the spot, and 18.90 @ 18.80 to arrive; Tin 92 @ 97.—*Borsen-Zeitung.*

## HOLLAND.

ROTTERDAM, June 12, 1885.—Tin.—The demand has revived, and Banca spot, is now wanted at 52 guilders @ 35, but held at 52.25, while Biliton, spot, is bringing 51.25 and has been sold at 52 for September delivery. —*Koch & Vlierboom.*

## AUSTRIA.

VIENNA, June 14, 1885.—Iron.—The market has so far failed to revive since the holidays; the only new business in prospect seems to be bridge-building and adjudications for Rails in Hungary. But no articles in the Iron and Hardware trade are in request. The new duties in Russia put a stop to export from Bohemia. Following is the foreign Iron and Steel movement in Austria-Hungary during the first quarter:

	Imports.—		Exports.—	
	1885.	1884.	1885.	1884.
	Tons.	Tons.	Tons.	Tons.
Pig Iron.....	8,074	18,853	2,634	1,469
Merchant Iron.....	8,221	10,415	165	369
Blooms.....	31	10	111	4
Bars, Steel and.....	314	1,453	35	63
Rails.....	250	260	65	36
Sheet Iron and.....	190	315	736	719
Castings.....	723	619	459	263
Finished Iron.....	2,323	2,354	970	1,511
Iron Pipe.....	118	184	26	57
Boilers.....	30	45	10	18
Hoops.....	45	259	47	7
Nails.....	191	77	805	288
Total.....	15,500	30,007	5,543	4,824

We quote at the close: White Pig, 47 @ 48 for ones  
 & 49 for Greys; 54 @ 54 1/2 for ones; 54 1/2 @ 55 for  
 100 lbs; Bessemer Merchant, 100 @ 125; Bohemian, 100 @  
 105; Sheets for Locks, 160 @ 170; Sheets for roof-  
 ing, 170 @ 175; Elder Sheet, 160 @ 175; Tank  
 Sheets, 170 @ 175; Bolts, 106 @ 115; Metals dull  
 and depressed.—*Austrian Trade Journal.*

We quote at the close: White Pig, 47 @ 48 florins per ton; Gray Pig, 54 @ 54; Bessemer, 54 @ 56; Styrian Merchant, 130 @ 125; Bohemian, 100 @ 108; Silesian, 160 @ 160; 170 @ 170; Sheets for roofing, 180 @ 175; Bolts, Spelter, 190 @ 170; Tank Sheets, 170 @ 175; Beams, 106 @ 115. Metals dull and depressed. —*Austrian Trade Journal.*

## AUSTRALIA.

SYDNEY, N. S. W., June 5, 1885.—Iron.—Stocks of Pig rapidly accumulate in store, and as consumers continue holding back there is a downward tendency. —*Per cable via London.*

their respective claims; and every provision in any assignment providing for the payment of one debt or liability in preference to another shall be void, and all debts and liabilities (including judgments rendered by confession 30 days previous to such assignment) shall be paid *pro rata* from the assets thereof; and every such assignment shall be proved or acknowledged and certified and recorded in the same manner as is prescribed by law in cases wherein real estate is conveyed.

## METALLURGICAL NOTES.

## Self-Hardening Steel.

Mr. Adam Tindel, of the Frankford Steel Works, Philadelphia, is producing a tool steel which possesses remarkable qualities. Its chief peculiarity consists in its being self-hardening. No process of hardening in water or other liquids nor of subsequent tempering is necessary in its use. In this respect it resembles Mushet's steel. In making a tool from Mr. Tindel's steel it is shaped over the anvil, as with ordinary tool steel. When the tool is forged it is laid aside to cool in the air. When quite cold it is found to have taken a hardness exceeding that of any steel hardened by the usual process of immersion in water or brine. So hard is it that the teeth of a Stubbs' file will be turned by a single stroke across it, and the edge of a finely-tempered cold-chisel completely destroyed in an attempt to cut it, not the slightest impression being left on the Tindel steel. Another peculiarity of the metal is its ductility in forging. It forges and welds to iron quite as readily as tool steel. At the usual heat no difference can be perceived in its capacity for being drawn, bent or tortured from any good quality of cast steel. We have been shown samples of this material, and the file and chisel tests certainly show a superiority in hardness above that of tempered steel. Mr. Tindel has a number of reports from prominent manufacturing firms and railroads who have been using his steel for nail cutters, dies and lathe and planer tools, working on tires and hard castings, which go to show that the steel, which he has named *Acier Imperiale*, will occupy a prominent place in the line of tool steels for the special uses for which such a grade of metal is adapted.

## The Recovery of Phosphoric Acid from Basic Bessemer Slag.

A German chemist, Herr Blum, at Alzette, in Luxembourg, has patented a process for utilizing the phosphoric acid from the basic Bessemer process. Instead of adding lime to the iron during the blow, he adds carbonate of soda free from sulphur. This is introduced into the converter in a melted state, in the proportion of 5.13 parts to every 1 part of phosphorus; and 7.85 parts to every 1 part of silicon; then the pig iron is run in and blown as usual, when the slag is tipped out into an iron wagon. This slag contains phosphate and silicate of soda, and according to the nature of the lining it also contains more or less iron, manganese, lime, magnesia and sulphur. It may be used at once direct as a manure, or it may be treated first with cold water to extract phosphate of soda, which has a market for many purposes, after which silicate of soda may be extracted by hot water and used for making water glass, and the metallic residue may be used for making ferromanganese. A pamphlet by the inventor undertakes to show that the process can be worked at a profit. At Creusot, in order to save carbonate of soda in working extra siliceous pig iron, lime is first added to combine with the silica formed, and thus slag is removed, after which carbonate of soda is added and a second period of the blow takes place, the phosphoric acid combining with the soda, as above. It is stated that vanadium is lost every year in the slags at Creusot, and that this could be separated from the first extract of the soda slags by cold water.

Styrian Magnesite Brick.

About a year ago extraordinary deposits of magnesite were discovered in Styria, the composition of the material being approximately as follows:

	Per cent.
Carbonate of magnesite.....	90.3 to 97.32
Carbonate of lime.....	0.5 to 0.61
Alumina.....	1.4
Iron oxide.....	4.49
Insoluble residuum.....	3.73

This residuum is found to consist of:

	Per cent.
Silica.....	39
Alumina.....	21
Iron oxide.....	38
Magnesia.....	2.41

Magnesite, after being dead burnt, is chiefly employed in the form of magnesite stone for furnace bottoms, and already a considerable trade has sprung up for this and other purposes. The first experiments with dead-burnt magnesite and magnesite stone were made at a large steel works in Poland, where previously the operation of steel manufacture had been carried on by the Siemens-Martin system with acid bottoms and linings and arches of Dinas brick. The furnaces were charged and tapped twice in 24 hours. The acid lining, however, was not sufficiently proof against the heat and the chemical action set up in the furnace, for in a short time the bottoms and arches became completely melted, and thorough repairs were needed every fortnight or three weeks. It was subsequently decided to adopt the basic dephosphorizing process, and dolomite was employed for the furnace bottoms, the side walls and arches being still lined with acid material. As, however, these last-named parts were still exposed to the intense heat, dolomite brick were added as a protection. A difficulty then arose as to how to separate the Dinas stone of the arch from the dolomite brick of the side walls, for if the two remained in contact they would melt and run together. As an isolating substance, graphite and bauxite brick were tried, but eventually abandoned in favor of magnesite brick. The extraordinary durability and refractory qualities of this course of magnesite brick speedily led to the adoption of the material for the lining of the side walls, for the formation of the bottom of the furnace, and eventually for the covering of the arch of the open-hearth furnace as well. The results have proved completely satisfactory.

The furnaces, according to the *Ironmaster*, can now be worked three turns in 24 hours, and continuously for six or seven months.

## An Encouraging Outlook.

R. G. Dun & Co.'s review of the business of the country for the first half of the current year indicates a more hopeful condition of business than has been generally anticipated, owing to the universal reports of dullness, want of profit and prospective depression. Comparing the six months of 1885 with the same period in 1884, the number of failures has increased from 5510 to 6004, while the liabilities have decreased from \$124,371,282 to \$71,722,355. Of these failures, however, only 2346, with liabilities of \$28,601,000, are to be charged to the second quarter, showing a progressive improvement. That the improvement is due to general causes is shown by the fact that the same ratio of decrease is exhibited in the report from the Dominion of Canada, which shows failures numbering 600, with liabilities of \$5,106,105, as compared with 752 failures and liabilities of \$10,742,600 for the corresponding period of 1884. The most marked decrease in the liabilities in any one section is in this city, where they show only \$8,800,000, as against \$57,600,000 last year. That the failures are of much less importance than heretofore is manifest by the decrease in the average liabilities, which in the last quarter show \$12,000 per failure, as against \$38,000 in 1884 and \$18,900 in 1883.

The review says: "While, therefore, a review of the trade of the country does not bring out many satisfactory elements, it nevertheless is a fact that consumers as a class are really in better condition than a year ago, and that, in view of the low stocks of merchandise in all hands, the decrease in internal indebtedness, the lessened number of failures, the low prices for living and the steady tendency to economy which the year has witnessed, there is much ground for the belief that the autumn business will be in the main satisfactory. With the probabilities of a fair yield of agricultural products in the West and Northwest, the good promise of the cotton crop in the South, with the increased immigration of the best class which thus far the year has shown, with a plethora of money at low rates, a settled financial policy, and the absence of political excitement, there ought to be no reason why a marked improvement in business should not ensue."

Appended to the review are special and detailed reports from the business and manufacturing centers throughout the country, showing a general, even if slow, tendency to a steady improvement in all branches of trade.

## Recent Treasury Decisions.

DUTY ON ARTICLES COMPOSED OF TWO MATERIALS.

On an appeal from an assessment of duty at the rate of 45 per cent. ad valorem on certain nail cleaners, the appellant claiming 30 per cent. ad valorem, the Secretary says: "These articles are made partly of bone or ivory and partly of iron, and they are not specially enumerated in the existing tariff. There are two provisions in the tariff applicable to such articles—one for 'manufactures, articles or wares not specially enumerated or provided for in this act, composed wholly or in part of iron,' at a duty of 45 per cent. ad valorem, and the other for 'bone, \* \* \* ivory, \* \* \* all manufactures of, not specially enumerated or provided for in this act,' at a duty of 30 per cent. ad valorem. Under Section 2499, Revised Statutes, duty is to be charged at the higher of the two rates mentioned, which was the rate assessed by you."

## CHROMOS PRINTED ON BRASS.

The department on an appeal from an assessment of 45 per cent. ad valorem on certain chromo-lithographs, the appellants claiming 25 per cent., says: "It appears that the articles in question are brass plaques, about 12 inches in diameter, with a lithographic picture printed on them in colors. Chromo lithographs are not specifically provided for in the tariff, but are classed with printed matter. By departmental decision of January 25, 1884, iron show-cards (being printed matter on iron) were held to be dutiable as manufactures of iron. The difference in the character of the printing, or in the metal printed upon, is not sufficient to exempt these articles from the payment of duty at the same rate, under T. I., new, 216."

## BUTTON MATERIAL OF ZINC AND NICKEL.

On an appeal from 45 per cent. ad valorem, claiming 2½ cents per pound on certain so-called sheet zinc, the department says: "It appears that the article is not the sheet zinc of commerce, but a substance commercially known as 'button material,' which consists of a thin sheet of zinc, coated or plated with nickel, and intended for use in the manufacture of buttons. This substance is not specially provided for by name, and is not regarded by the department as 'plated ware,' but is held to be dutiable at the rate of 45 per cent. ad valorem, as a manufacture in part of zinc and nickel, under T. I., new, 216."

M. P. Hayes, of Chicago, Ill., has patented a process of casting metals, which is claimed to produce a casting free from blow-holes. The temperature of the metal when it is poured into the molds is raised to, say, 2300° F. This temperature is retained through the mold for a considerable time after the metal is poured in, which is to prevent any considerable current of heat from the center of the metal toward the cooler portion. The degree of heat is very gradually lessened until the metal assumes a pasty condition and the atoms or molecules no longer possess the freedom of motion which is necessary for perfect crystallization. By the exclusion of air and the keeping of the metal at a high temperature the inventor claims to prevent evolution of gases and the formation of crystals, thus producing solid castings. The molds are made entirely of refractory material, such as fire-clay which is polished at the inside with a thin coating of plumbago and sour beer.





**L. COES'**  
GENUINE IMPROVED  
**Knife Handle**  
PATENT  
**Screw Wrenches**  
MANUFACTURED BY  
**L. COES & CO.,**  
Worcester, Mass.  
ESTABLISHED IN 1839.



Patented July 6, 1880. Patented July 8, 1884.  
Registered March 31, 1874.

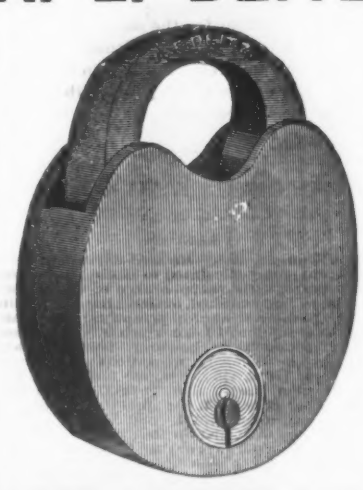
*Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.*  
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.  
Send for Illustrated Price List and Circular.

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Made to any Length,  
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Guaranteed to Run  
Straight, Even Through-  
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Clings well to the Pulley,  
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are still covered by six good and valid patents, which have several  
years to run. Quotations on our full line will be furnished on request.

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**CHAMPLAIN**  
**Forged Horse Nails.**  
MANUFACTURED BY THE  
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HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST  
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ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

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manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when  
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U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808  
pounds to the sectional square inch, and an average reduction of area of the fractured  
section of 30% per centum. Our prices are as low as the production of a good article will admit of.

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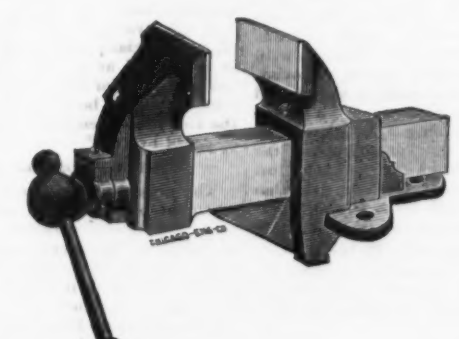
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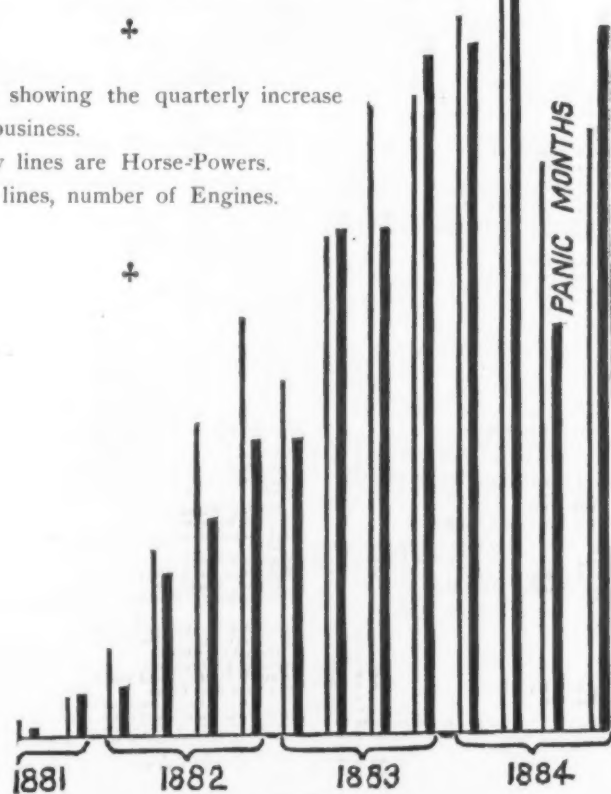
THE QUAKER CITY Reduced in Price.  
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# The Westinghouse Engine

Chart showing the quarterly increase of our business.

Heavy lines are Horse-Powers.  
Light lines, number of Engines.



## SOME FACTS.

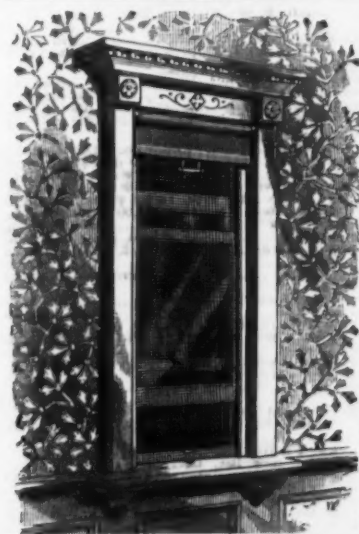
Up to May 1st, '85, TWENTY-ONE PER CENT. of our sales have been bona fide REPEATED ORDERS (2 to 12) from actual users (not agents), and do not include about twenty-five exchanged engines—the balance for increased power or automatic cut-off, the difference being paid in many cases. From 200 to 300 have displaced other engines. On the contrary, we know of but three parties who, having bought one Westinghouse Engine, have failed to give us their subsequent orders. We have learned of but six second-hand engines being offered for sale, all of which were either from fire or failures. Nine engines (our earliest) were thrown back on our hands altogether. This is our record, with about 1500 engines running.

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KEATING IMPLEMENT & MACHINE CO., Dallas, Texas.  
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is an Oil-Print Linen Gauze, plain and figured, mounted on a Hartshorn Spring Roller, the edges moving in grooved mouldings on the sides of the window.

Flies and mosquitoes are effectually excluded. The following advantages over all other kinds of Screens will be apparent:

The whole window is covered.  
Either Sash may be opened or both at the same time, thus securing better ventilation.

More easily handled, working as easily as an ordinary Shade.

Does not interfere with either Shade, inside Shutter or outside Blind.

May be rolled up and left in place all winter; but if desirable to remove, comes out as readily as a shade, and occupies but little space.

Costs less, will last longer and is more easily renewed than any other good screen.

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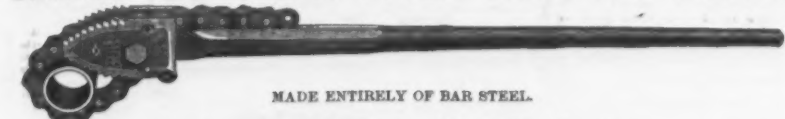
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## EXACT SIZE.

This Wrench is made of Malleable Iron, close fitting and well finished throughout. It is light, weighing but four ounces. The sliding bar opens one and a quarter inches, making a very desirable tool for machinists, tool-makers, amateurs and bicyclists. Packed half-dozen in a box. Prices, plain polished, \$5 per dozen; nickel-plated, \$4 per dozen. Discount, 40 %.

## BROCK'S PATENT DROP FORGED CHAIN PIPE WRENCH.



MADE ENTIRELY OF BAR STEEL.

Six Sizes; adapted for Pipe from 1/4 to 14 inches diameter.

Each number will fit a range of sizes equal to six or more pairs of common tools, while it will outwear an equal number of any kind. All parts are interchangeable, and can be readily renewed.

J. H. WILLIAMS & CO.,

Manufacturers of Every Description of Iron and Steel Drop Forgings,  
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Door Locks, Knobs,

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FILES RE-CUT

Without Drawing the Temper.

About One-Half Usual Prices.

SAMPLES RE-CUT WITHOUT CHARGE.

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THE ACME CO.,

COLLINSVILLE,

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## INDUSTRIAL ITEMS.

### NEW HAMPSHIRE.

The annual meeting of the Nashua Iron and Steel Company was held Wednesday of last week, at the office of Geo. & John F. Stark, in Exchange Building, when the following officers were chosen for the ensuing year: Directors, John A. Burnham, Boston, president; William A. Burnham, Boston; Aretas Blood, Manchester; George Stark and Virgil C. Gilman, Nashua. Aretas Blood, treasurer; Edson F. Chandler, clerk and paymaster.

The Portsmouth Machine Company at present employ a working force of 100 men.

The Concord Monitor says that efforts are being made to induce a Massachusetts firm of machinists to remove their business to Dover. New Hampshire has of late been striving hard to secure industries at present located in the Old Bay State.

### MASSACHUSETTS.

A petition has been filed in the Insolvency Court that the Lamson & Goodnow Mfg. Co., Shelburne Falls, might be declared insolvent. It is regarded as settled that the company will be obliged to go into insolvency.

At the recent annual meeting of the Sturtevant Mill Company, Mr. E. C. Huxley was chosen president. The Sturtevant mills for grinding and crushing ores, phosphates and other hard materials work on a new principle, avoiding the usual wear and tear of machinery. Each mill is in effect a stamp mill and crusher combined, performing the functions of both in the most thorough manner.

### CONNECTICUT.

The watch shop at Thomaston shuts down for 10 days from July 3. The American Knife Company there have resumed work with a short complement of hands.

The Southington Cutlery Company have begun operating their wood-screw department 11 hours per day. Their orders, it is said, will keep them busy for three months.

The Hendey Machine Company, of Torrington, report an increase of at least 25 per cent. of business so far this year over a similar period last year.

### PENNSYLVANIA.

Harrison Boiler Works, Germantown Junction, Philadelphia, report a steadily growing demand from all sections of the country for their patent safety boiler. Quite a number of the users of this boiler, after many years' practical experience and test of its merits, have repeated their orders, thus showing their appreciation of the good qualities of the boiler.

Schaeffer, Merkel & Co., of Fleetwood, are still very busy, especially on all kinds of mill machinery. They still have a force of men at work every night. This season they have already sold over 100 hay rakes and over 100 mowers, reapers and binders.

The Lebanon Stove Works have shut down until after the 4th of July.

C. E. Pennock & Co. are building a puddling furnace at their Valley Forge Iron Works.

The new furnace at Robeson is rapidly approaching completion. The inside walling is about 8 feet higher than it was when the accident occurred. All other work is being pushed vigorously. It is expected that by September the work will be completed. The nine mine roasters are in full operation, and many thousands of tons of ore have been run through and are now being piled up for use as soon as the furnace is put in blast.

The Chesapeake Nail Works, Harrisburg, closed down last Thursday evening for repairs, and will not be started up again until the 6th of July. The works usually close at this time of the year, and the managers claim that they should really have a longer time to make changes, but the press of orders will not allow it.

The Slatton Electric Light Company have received their charter and will put up the Edison system of incandescent lighting.

The large stack at the Friedensville zinc mines is being repaired. It is the intention to start up the big engine in a short time.

Messrs. George Boyce, P. L. Kimberly, D. Egan and Hon. E. A. Wheeler, a syndicate of Sharon capitalists, have, after several days' negotiation with the inventor of the Davy process of making steel, secured the entire control of the manufacture of the article in the United States. Hon. E. A. Wheeler, representing the capitalists, went to England this spring and brought Mr. Davy to Sharon with him, and after hearing him explain the superiority of the process secured the control of the same. It is expected that several plants will be built in the locality of Sharon soon, the main plant being about one-half mile north of town. The others will be as follows: P. L. Kimberly & Co., 10-ton plant; Boyce, Rawle & Co., 80-ton plant, and Wheeler Iron Company, 50-ton plant. The Sharon capitalists will not only have the right to sell rights of territory, but will manufacture necessary machinery and test it before shipment. Mr. Davy has received numerous letters since his arrival in the United States, inquiring about his patent. It is thought that the purchasers will have no difficulty in disposing of the right to manufacture the article.

The Sharon Light and Heat Company have been organized by the several subscribers to the fund of \$2000 for drilling in Sharon for natural gas. Mr. J. J. Spearman was elected president; Thos. Tanner, secretary, and John C. Owsley, treasurer. Mr. R. S. Henderson was appointed to procure leases of territory. The location of the test well has not yet been determined, but it is probable that it will be somewhere on the west side of the river. Work on it will be begun soon.—Herald.

A press dispatch states that the following blast furnaces in Eastern Pennsylvania will soon go into blast: Colebrook No. 1, at Lebanon, which has a capacity of 626 gross tons of pig iron per week, on all-Cornwall ores; Glendon Nos. 1 and 3, located at

Easton, Northampton County, operated by the Glendon Iron Company; Montgomery, located at Port Kennedy, Montgomery County, operated by the Montgomery Iron Company, and has an annual capacity of 12,500 net tons; and Elizabeth, located at West Conshohocken, and operated by the Merion Iron Company. The same company have the Merion Furnace in blast at the same place, and the capacity of both is 700 net tons per week. Two of these, the Elizabeth and Montgomery, are ready to have the match applied. Rock Hill Furnace, at Oriskany, Huntingdon County, which has an annual capacity of 30,000 net tons, is also ready to go in blast.

About 30 men and boys in the rolling mill, packing-room and tapping department of J. H. Sternbergh's bolt and nut works, Reading, have been notified that their wages would be reduced 10 to 15 per cent., to take effect July 1.

The glass works at Royer's Ford will be shut down during July and August.

A report is in circulation that arrangements are being completed for changing the Paxton plate mill, Harrisburg, into a steel mill. This action will do away with the puddlers. It is anticipated that the new departure will give employment to an extra number of men.

All of the stove foundries at Royer's Ford are running on full time, with plenty of orders.

### PITTSBURGH AND VICINITY.

The Kelly & Jones Company, manufacturers of heating and ventilating apparatus, have secured the contract over a host of competitors for heating and ventilating the new school buildings at Everett, Pa. In their line they outrank competitors from other cities and hold first place.

The glass mold factory of Washington Beck & Co., on the South Side, was badly damaged by fire on June 25. The chief loss, however, was the destruction of the contents of the factory, consisting of costly machinery, molds and patterns, which were damaged and destroyed to the extent of \$10,000. The losses fully covered by insurance. Repairs will be commenced at once.

The Keystone Bridge Company are constructing the massive steel girders which will be used to support the Bartholdi Statue of Liberty in New York harbor.

The new structural mill of the Pittsburgh Bessemer Steel Company, at Homestead, which is being built, will be one of the finest in the country when finished. In elaborateness of detail, it is said, it cannot be surpassed. Every department will be most complete.

The machine shops of McIntosh, Hemphill & Co., which have only been working seven hours a day, began work on double turn the latter part of last week. They have received two large orders from Iowa and one from Ohio, which will keep them at work some weeks. The force will be increased to 300 men.

Reports state that it is in contemplation to build a frog department at the Edgar Thomson Steel Works. Heretofore they have made nothing except heavy rails. It would require a new mill and the employment of a number of additional workmen.

The Chartiers Valley Gas Company are drilling four wells at Hickory, in the Washington gas field. The gas secured will be piped to Pittsburgh.

The Chicago, Burlington and Quincy Railroad have given the Edgar Thomson Steel Works an order for 10,000 tons of steel rails, to be furnished immediately, and to be followed within two months by another of 20,000 tons. The company are said to consider Pennsylvania rails superior to those made in Illinois.

The Champion Natural Gas Company have struck a strong flow of gas at the depth of 900 feet on the Duff farm, at Murrysburg.

The Spang Steel and Iron Works have turned out a pair of boiler heads 102 inches in diameter and 1/2 inch thick, weighing 2000 pounds each.

The mineral-wool factory at the Isabella Furnace has been enlarged on account of increased business.

### OHIO.

Brick masons are at work tearing out all the furnaces at the Laughlin Mill, Martin's Ferry. The company will then extend their factory in the place of them, and put in 80 more machines. They will put in another set of rolls, two heating furnaces and three annealing furnaces. No more iron will be worked in the mill.

The second steel range ever made in Iron-ton is exhibited in front of H. D. Newcomb's store. It comes from Witman's Foundry. The first one made is in use in J. A. Witman's kitchen, and gives evidences of superior qualities. The manufacture of ranges here marks a new epoch in our foundry work. It is an advance step in the march of progress. The Foster Stove Works will also be equipped to manufacture ranges from the start.—Iron-ton Register.

The Bellaire Nail Company posted notices last week stating that their mill would resume work this week with non-union employees. Those of the former hands who belonged to the Amalgamated Association are still striking.

The Niles Tool Works, Hamilton, have just shipped a 6-foot boring and turning mill (weight 26,000 pounds) to St. Petersburg, Russia.

Citizens of Minerva covet the Massillon glass works, and are trying to raise \$15,000 as a subsidy to secure its removal; \$12,500 has been subscribed.

### ILLINOIS.

The Prindle Mfg. Co., of Aurora, are re-fitting their entire works, and are putting in a line of new machinery, including a 100-horse-power Cummer engine, with steel locomotive boiler, large enough to supply steam for the engine and for heating. The company expect to be running by July 20th. The specialties to be made include Prindle's improved sliding-door hanger, a barn-door

hanger and several specialties in builders' hardware.

An improved air compressor for the Gottfried Brewing Company has just been built by Wheeler & Tappan, of Chicago. It is designed for running the pumps in the fermenting and cooling rooms. It runs with air instead of steam. It is both original and simple in construction. An order from Idaho for four large steam pumps has recently been booked by this firm.

The contract for the structural-iron and truss work for the new factory of the Crane Brothers Mfg. Co., Chicago, has been given to M. Benner & Co., of that city. This firm is also shipping a lot of handsome brackets, hitching posts and ornamental work to Delaware, fire-escape to Appleton, Wis., and court-house work to Brewton, Ala. A large amount of ornamental work for local structures is also reported.

The Metal Novelty Works is the style of a new concern just established in Chicago, for the manufacture of all kinds of architectural, ornamental and decorative metal work, and special machinery. A specialty will also be made of furniture hardware. The members of the firm are Roderick McLeod, Henry Carstens and Waldemar Baur. The enterprise starts out with a good share of orders.

### MISSOURI.

The negotiations which have been under way for some time regarding the removal of the Standard Tool Works, of St. Louis, to Roanoke, Va., have been broken off, and the visiting committee have gone home.

The Wrought Iron Range Company, of St. Louis, will soon raise their extensive works one story higher, making them three stories high instead of two, as at present.

As stated in a previous edition of this journal, the purchasers of the Harrison Wire Works were the holders of the 149 first-mortgage bonds, each of a face value of \$1000. Their names, together with the amounts held by them, are here given: Kidder, Peabody & Co., New York, \$44,000; James Cumiskey, city, \$35,000; B. F. Kelcher, city, \$20,000; Manhattan Company, New York, \$15,000; Albert Arnstein, city, \$5000; David Block, city, \$10,000; General Wm. T. Sherman, city, \$6000; W. S. Johnston, city, \$5000; Jno. D. Davis, city, \$3000. The property is now in possession of the agents of these parties, Mr. James Cumiskey and Mr. Geo. F. Crane, the former representing local and the latter Eastern interests, and will be sold again, provided a buyer with acceptable terms can be found. To the present owners it represents an investment of \$175,000, taking in account not only the bonds, but unpaid interests on the same, and \$17,000 of expenses incurred in the receivership matter and in making sale. It is hardly necessary to remark in this connection that no one authorized to speak for the Harrison Wire Works has ever suggested their removal to Pittsburgh or any other place.—Age of Steel. The last remark is called forth by the mistake of certain papers in supposing that Lieutenant Fitch's new company, instead of building new works, which, as stated in our issue of June 11, is their plan, intended to remove the Harrison Wire Works, with which Lieutenant Fitch was formerly connected, to Pittsburgh.

### MICHIGAN.

The Frontier Iron and Brass Works Company is a new corporation at Detroit, with a capital stock of \$150,000, \$125,000 of which has been subscribed. It will manufacture engines and general machinery. The stockholders are Thos. S. Christie, Elbridge G. Philbrick, Thos. S. Christie, trustee, Hiram Walker, O. W. Shipman, Henry W. Rood, Thos. W. Palmer, William D. Robinson, Uriah C. Chapin, T. K. Christie and W. V. Moore. Messrs. Walker, Philbrick, Rood, Shipman and Thos. S. Christie have been chosen as directors of the association.

### WISCONSIN.

The Giesler Smoke Consumer Company, Limited, have filed articles of association with the Secretary of State, the object being to manufacture and sell the Geisler consumer in and for the State of Pennsylvania. The general offices will be located in Milwaukee, and a branch office is to be established in Philadelphia. The capital stock is \$500,000, divided into 5000 shares, and the incorporators are Thos. G. de Normandie, C. B. Manville and C. H. Stewart.

It is said that the J. I. Case Plow Works, of Racine, will soon resume work with a good force of men.

### WEST VIRGINIA.

Owing to a reduction of 10 per cent. at the mold shop of the Etna Glass Works, the mold cutters have gone out on a strike.

### ALABAMA.

The Bessemer converter to be used in connection with the furnace now in course of construction for the Pratt Coal and Iron Company has arrived at Birmingham. The company, it is stated, will make the first test of the Bessemer process ever made in the South.

### GEORGIA.

The Cherokee Iron Company, at Cedartown, have completed the rebuilding of their blast furnaces. The stack has been enlarged and relined, and new engine and blowing machinery put in, and other improvements made.

The American Metallic Fastening Association, of Boston, Mass., has patented a machine for stripping metal. The object of the machine is to divide a ribbon of metal into a number of narrow strips. It consists essentially of two shafts, placed one above the other, and provided with a series of disks which are so arranged that one larger disk is placed between a pair of smaller disks. The larger disks constitute the cutters. The large disks of the upper shaft are placed in line vertically with the small disks of the lower shaft, and vice versa. The ribbon of metal to be split is guided to the cutters by a pair of guide pieces. After being cut, the narrow strips project respectively beneath and above the plane on which they have been cut. To throw them back into the same plane before being wound on the receiving reel, a series of pivoted fingers are employed.











## WHOLESALE METAL PRICES, July 1, 1885.

## METALS.

**IRON.**—Duty: Bars, 8-10¢ to 11-10¢ per lb. provided that no Bar Iron shall pay a less rate of duty than 35¢. Sheet, 11-10¢ to 15-10¢ per lb. Band, Hoop and Scroll, 1¢ to 1-10¢ per lb. Railroad Bars weighing more than 35 lb per yard, 7-10¢ of 1¢ per lb.

## Standard American Pig Iron.

Foundry No. 1 X..... per ton \$17.75 @ 18.50  
Foundry No. 2 X..... per ton 16.50 @ 17.50  
Gray Forge..... per ton 15.50 @ 16.50

## No. 1 Scotch Pig Iron.

Carnbroe..... per ton 19.00 @ 19.50  
Coltress..... per ton 21.00 @ 21.50  
Shotts..... per ton 21.50 @ 22.00  
Glenbrook..... per ton 19.00 @ 19.50  
Gartshore..... per ton 21.00 @ 21.50  
Langlois..... per ton 21.50 @ 22.00  
Summerlee..... per ton 20.50 @ 21.00  
Dumfries..... per ton 19.00 @ 19.50  
Eglington..... per ton 18.00 @ 18.50  
Clyde..... per ton 19.00 @ 19.50

## Rails.

Steel, at Eastern mills..... per ton @ 27.00  
Old Rails, Ts..... per ton 16.50 @ 16.75

## Wrought, per ton, from yard.

Common Iron..... 15.00 @ 18.50

## Bar Iron from Store.

Common Iron: 1 to 1 in. round and square..... per lb. 1.5 @ 1.65¢  
Refined Iron: 1 to 1 in. round and square..... per lb. 1.7 @ 2.1¢  
1 to 6 in. x 1/4 to 1 in..... per lb. 1.8 @ 2.4¢  
Rods—1/2 and 1-1/2 round and sq..... per lb. 1.7 @ 2.3¢  
Bands—1 to 6-1/2 to No. 12..... per lb. 2.5¢  
"Burdon's Best" Iron, base price..... per lb. 2.9¢  
Burdon's "H. B. & S." Iron, base price..... per lb. 2.5¢  
Norway Nail Rods..... per lb. 5 @ 6¢

## Sheet Iron from Store.

Common..... per lb. 2.70 @ 3.4¢  
American..... per lb. 3.4¢  
Cleaned..... per lb. 3.4¢  
Nos. 10 to 16..... per lb. 2.70 @ 3.4¢  
17 to 20..... per lb. 3.4¢  
21 to 24..... per lb. 3.4¢  
25 and 26..... per lb. 3.4¢  
27..... per lb. 3.4¢  
28..... per lb. 3.4¢  
29..... per lb. 3.4¢  
30..... per lb. 3.4¢  
Galvanized, 10 to 30..... per lb. 3.4¢  
Galvanized, 21 to 24..... per lb. 3.4¢  
Galvanized, 25 to 26..... per lb. 3.4¢  
Galvanized, 27..... per lb. 3.4¢  
Galvanized, 28..... per lb. 3.4¢  
American Russia..... per lb. 3.4¢  
Russia..... per lb. 3.4¢  
American Cold Rolled B. B..... per lb. 3.4¢

## Iron Wire.—(See Wire.)

**STEEL.**—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢ per lb., 25¢ ad. val.; valued above 7¢ and not above 10¢ per lb., 15¢ ad. val.; valued above 10¢ per lb., 10¢ ad. val. Extra—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

## American Cast Steel.

For American Steel, see Pittsburgh quotations.

## English Steel.

Best Cast..... per lb. 10¢ @ 12¢  
Extra Cast..... per lb. 12¢ @ 14¢  
Circular Saw Plates..... per lb. 14¢ @ 16¢  
Round Machinery Cast..... per lb. 16¢ @ 18¢  
Swaged Cast..... per lb. 18¢ @ 20¢  
Blister, 1st quality..... per lb. 20¢ @ 22¢  
German Steel, Best..... per lb. 22¢ @ 24¢  
2d quality..... per lb. 24¢ @ 26¢  
3d quality..... per lb. 26¢ @ 28¢  
Sheet Cast Steel, 1st quality..... per lb. 28¢ @ 30¢  
2d quality..... per lb. 30¢ @ 32¢  
3d quality..... per lb. 32¢ @ 34¢

## Tin.—Duty: Plates, Sheets, Taggers and Terns.

1¢ per lb.; Bars, Block and Pigs free.  
Banca..... per lb. 22¢ @ 23¢  
Straits..... per lb. 23¢ @ 24¢  
English..... per lb. 24¢ @ 25¢  
Bar..... per lb. 25¢ @ 26¢

## Charcoal Tin Plates.

1 C 10x14 225 sheets..... per box \$5.00 @ 7.00  
1 C 12x12 225 sheets..... per box 5.00 @ 7.00  
1 C 20x28, 112..... per box 10.00 @ 14.25  
1 X 10x14 225 sheets..... per box 6.25 @ 8.75  
1 X 12x12 225 sheets..... per box 6.25 @ 8.75  
1 X 14x20, 112..... per box 6.25 @ 8.75  
1 C 12x14 17 100..... per box 8.00 @ 5.50  
D X 12x14 17 100..... per box 6.25 @ 7.00  
For each additional X add..... 1.25 @ 2.00

## Coke Tin Plates.

Best..... per lb. \$4.60 @ \$4.75 @ 4.50  
Ordinary..... per lb. 4.75 @ 4.50 @ 4.25  
1 C 10x14..... per box 7.25  
1 C 20x28, 112 sheets..... per box 10.00

## Terne Plates.

Prime Char. 3d quality..... per lb. \$4.60 @ 4.75 @ 4.50  
1 C 14x20 M. F. 36.75 @ 6.875 @ 6.50  
1 C 14x20 Old Process..... per box 13.75  
1 C 20x28..... per box 14.50 @ 14.25 @ 14.00  
1 X 14x20..... per box 6.00 @ 6.125 @ 6.25  
1 X 12x12..... per box 6.25 @ 6.375 @ 6.50  
1 X 14x20, 112..... per box 6.25 @ 6.375 @ 6.50  
1 C 20x28..... per box 9.00 @ 9.50 @ 8.75  
1 X 20x28..... per box 12.50 @ 14.00  
1 C 20x28..... per box 12.50 @ 14.00

## Tin Boiler Plates.

1 X 14x20, 3 sheets for No. 7, 112 sheets..... @ \$12.00  
1 X 14x20, 2..... No. 8..... @ 12.00  
1 X 14x20, 2..... No. 9..... @ 15.00

## COPPER.—Duty: Pig, Bar and Ingot, 4¢ Old.

Copper, 3¢ per lb. Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad. valorem.  
Ingot, Lake..... per lb. 11¢ @ 11¢  
Ingot, Baltimore..... per lb. 11¢ @ 11¢  
Ingot, Anchor..... per lb. 11¢ @ 11¢  
Brazilian Copper, ordinary sizes, 16 oz. per sq. ft. and over..... per lb. 17¢  
Brazilian Copper, ordinary sizes, under 16 oz. and over 12 oz. per sq. ft..... per lb. 18¢  
Brazilian Copper, 10 oz. and 12 oz. per sq. ft..... per lb. 20¢  
Lighter than 10 oz. per sq. ft..... per lb. 22¢  
Circles less than 84 in. in diam..... per lb. 23¢  
84 in. diam. and over..... per lb. 25¢  
Segment and Pattern Sheets..... per lb. 25¢  
Locomotive Fire-Box Sheets..... per lb. 17¢  
Sheeting Copper, over 12 oz. per sq. ft..... per lb. 16¢  
Bolt Copper..... per lb. 18¢  
Copper Bottoms..... per lb. 18¢  
Nickel-Plated Sheathing..... per lb. 35¢  
Plating extra..... for boilers..... per lb. 37¢  
Flat Copper Boiler Bottoms or Pits Bottoms, cut to special sizes..... per lb. 31¢

## Tinning.

14x18, by the case..... per sheet..... 2¢  
4x18, less than case..... per sheet..... 2¢  
For tinning both sides, double the above amount.

## O'Neill's Patent Platinized Copper.—Net.

14 and 16 oz. and heavier, 3¢ By the case, per lb. 25¢  
12 oz. and lighter..... per lb. 30¢  
Boiler Sizes:  
7 in., 14x52, 8 in., 14x56, 9 in., 14x60,  
14 and 16 oz. and heavier, 3¢ By the case, per lb. 31¢  
(And all sizes not over 20 in. wide.)

## 14 and 16 oz. and heavier..... per lb. 34¢

## 12 oz..... per lb. 37¢

## Copper Wire.—(See Wire.)

## Sheathing Metal.

Yellow Sheathing Metal, per lb. 30¢

## BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal;  
Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884..... per lb. 20¢ @ 20¢

## LEAD.—Duty: Pig, 2¢ per 100 lb.; Old Lead, 3¢

Pipe and Sheet, 3¢ per lb.  
American..... per lb. 4¢ @ 4¢  
Bar..... per lb. 4¢ @ 4¢  
Pipe..... per lb. 4¢ @ 4¢

## Block Tin Pipe..... 40¢

Tin Lined Pipe..... 15¢, dis 30¢  
Sheet..... 6¢, dis 30¢  
Shot..... Drop, 6¢; Buck, 7¢  
Galvanized..... 7¢

## ANTHRA.

Hallett's..... per lb. 10¢ @ 10¢  
Cookson..... per lb. 10¢ @ 10¢  
SPELTER.—Duty: Pigs, Bars and Plates, 1.50

per 100 lbs.  
American cash..... 4¢ @ 5¢  
Bergenport..... 5¢  
ZINC.—Duty: Pig or Block, \$1.50 per 100 lbs.

Sheet, 2¢ per lb.  
60 lb cases..... 5 @ 5.3¢  
Zinc—Open..... 5¢ @ 5.3¢  
Zinc Tubing..... dis. 10 @ 20¢

## Zinc Tubing—Dis. 25 s.

Plain..... 37¢  
Fancy..... 38¢  
Scotch and Extra Patterns..... 38¢

## HABBIT METAL.

N. P. U..... per lb. 6 @ 7¢  
X..... 10¢  
J. B..... 15¢

## WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

10 11 12 13 14 15 16 17 18

Bright Market Wire..... dis 70¢

Charcoal..... dis 50¢

Bale Wire, Nos. 7 to 12..... dis 65¢

Annulated Market Wire..... dis 70¢

Fence Wire, Nos. 8 and 9..... dis 50¢

Grape Wire, Nos. 10 to 14..... dis 70¢

Coppered Market Wire..... dis 65¢

Bale Wire, Nos. 7 to 12..... dis 60¢

Galvanized Market Wire..... dis 60¢

Fence Wire..... dis 55¢

## Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26

Cents..... 14 15 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36 37 38 39

Cents..... 28 29 30 31 32 33 34 35 36 37 38 39 40

Nos. 41 42 43 44 45 46 47 48 49 50 51 52 53

Cents..... 44 45 46 47 48 49 50 51 52 53 54 55 56

Nos. 57 58 59 60 61 62 63 64 65 66 67 68 69

Cents..... 58 59 60 61 62 63 64 65 66 67 68 69 70

Galvanized Stone Wire..... dis 55¢

## Steel Wire.

Cast Steel, Steel Wire list..... dis 55¢

## Brass and Copper Wire.

Old English Gauge the Standard.—Dis 40 @ 30.

Common High Low

Brass Brass Copper

All Nos. to No. 15, inclusive..... \$0.22 \$0.26 \$0.30

No. 17 and 18..... 28 32 36

" 19 and 20..... 34 38 42

" 21..... 35 39 43

" 22..... 36 40 44

" 23..... 37 41 45

" 24..... 38 42 46

" 25..... 39 43 47

" 26..... 40 44 48

" 27..... 41 45 49

" 28..... 42 46 50

" 29..... 43 47 51

" 30..... 44 48 52

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" 80..... 94 98 102

" 81..... 95 99 103

" 82..... 96 100 104

" 83..... 97 101 105

" 84..... 98 102 106

" 85..... 99 103 107

" 86..... 100 104 108

" 87..... 101 105 109

" 88..... 102 106 110

" 89..... 103 107 111

" 90..... 104 108 112

## Black Ivory Drop, fair..... 12 @ 15¢

Black Paint, in oil..... kegs, 8¢; assorted cans, 11¢

Blue, Prussian, fair to best..... in oil..... 40 @ 55¢

" Chinese dry..... 18 @ 30¢

Brown, Spanish..... 14 @ 25¢

" Van Dyke..... 10 @ 15¢

Green Chrome..... 18 @ 25¢

" Paris..... good, 20¢; best, 25¢

Iron Paint, Bright Red..... in oil..... 14 @ 15¢

" Purple..... 14 @ 15¢

" Ground in oil..... 14 @ 15¢

" Red..... 14 @ 15¢

" Brown..... 14 @ 15¢

" Purple..... 14 @ 15¢

" Red..... 14 @ 15¢

" Brown..... 14 @ 15¢

" Purple..... 14 @ 15¢

" Red..... 14 @ 15¢

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" Purple..... 14 @ 15¢

" Red..... 14 @ 15¢

" Brown..... 14 @ 15¢

" Purple..... 14 @ 15¢

" Red..... 14 @ 15¢

" Brown..... 14 @ 15¢

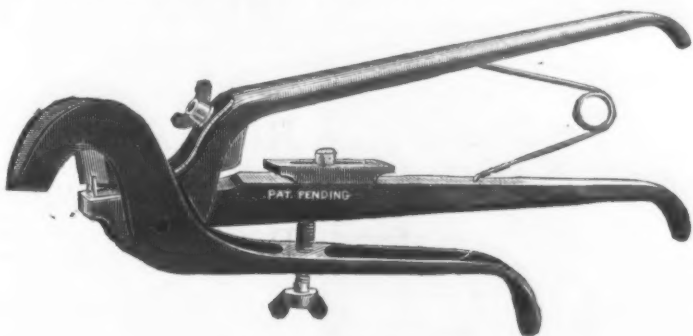
" Purple..... 14 @ 15¢



## HARDWARE NOVELTIES.

## "The Perfection" Saw-Set.

The Saw-Set shown below is known in the trade as the "Perfection," and is made by John A. Fischer, Covington, Ky. It is claimed to be the only one that will set the teeth of hand-saws, band-saws scroll-saws and meat-saws without injuring the teeth after the saw has been sharpened. The parts of this device are clearly shown in the engraving. The thumb-screw on the upper lever is attached to a guide, which may be moved back and forward on the anvil to suit the different sizes of teeth. The thumb-screw on the lower lever may be raised or lowered to regulate the pitch of the tooth to suit any kind of work. After the set has been adjusted the tooth side of the saw is laid over



The "Perfection" Saw-Set.

on the anvil. Then with a light pressure on the lever the teeth are set one at a time, care being exercised to have the gauge so adjusted as to admit but one-third of the tooth. In setting band-saws and scroll-saws the swedge between the upper and middle levers is used, the back of the saw being placed under the slide. This is adjustable to various widths. A gentle pressure is applied on the two upper levers in the same general manner as already explained. The maker claims that the tool is made of the best steel, and that the anvil in both front and rear is tempered by a new process that insures great durability.

## The "Victor" Door Knob.

There is probably no article in such common use and yet giving so poor satisfaction

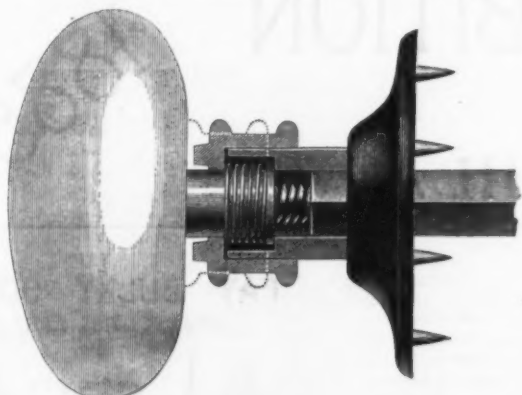


Fig. 1.—Longitudinal Section of the "Victor" Door Knob.

as the ordinary door knob. As commonly constructed it very readily gets out of order, and it is seldom repaired until its use is no longer possible. Accordingly, many loose knobs are encountered. Many improvements have been suggested for door knobs, but they have been in many cases too expensive for general introduction, or else so complicated as to make them impracticable. The Victor Door Knob Company, of Cleveland, Ohio, claim to have accomplished, in the device shown in Figs. 1 and 2, a construction that overcomes the ordinary objections and gives a knob that is simple and practicable in all its parts. They claim, further, that it successfully meets the demands of the trade for a Screwless Door Knob. The illustrations present sectional views of the knob in position, and show how it is to be turned up on the spindle until properly adjusted to the door. The roses are first placed in position on the door, the points on their backs being driven into the wood. The spindle, which is firmly secured to one of the knobs, is then passed through the hub of the

These knobs, we are informed, are made in all varieties of mineral, porcelain, jet and real bronze, and in various styles of finish.

## Adjustable Ratchet Wrench.

The accompanying engraving represents a Ratchet Wrench known in the trade as Coonee's Adjustable Wrench. It is claimed



Adjustable Ratchet Wrench.

to be the only ratchet wrench that can be used for different sizes of nuts or bolts without change of jaws or gears. The shape of the projecting lips is such that they will take countersunk heads or nuts. The manufacturers claim that the construction of the wrench is such as to sustain a greater strain than is possible with screw wrenches. They also claim that it is so put together that any parts that happen by any accident to be



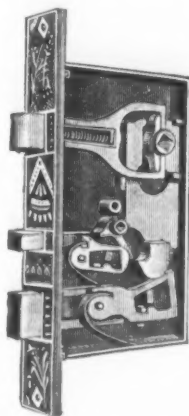
Fig. 2.—Sectional Perspective View of the "Victor" Door Knob.

latch, and the dependent neck, shown in the cut, placed thereon. The free knob, with the sleeve or collar attached, is then turned on to the threaded portion of the spindle until the sleeve reaches the neck. The sleeve is then drawn forward on the neck, the lugs within the sleeve entering the slots at the end of the neck, thus allowing the knob to be turned up on the spindle until it is properly adjusted to the thickness of the door. The sleeve is at this point released. The spring shown in the engraving throws it into the position indicated by the dotted lines in the cut, thus connecting the knob and the neck by the spurs on the back of the

## Burglar-Proof Door Locks.

The Perkins Specialty Lock Company, Nos. 29 to 33 St. Clair street, Cleveland, Ohio, are directing attention to the advantages possessed by their Locks, by which additional security is afforded over other forms of door locks. The leading feature to which attention is directed is that, when locked from the inside and the thumb-knob turned, the lock is left in a condition to be burglar-proof. By turning the thumb-knob the thumb-bolt is thrown, the latch and knob are securely locked and the keyhole closed by a solid piece of steel against the introduction

of any key or implement by which the locking-bolt might be tampered with. How this is accomplished will be readily understood by the figure, which shows the lock with the bolts thrown. It will be noticed that to



Burglar-Proof Door Lock.

the spindle throwing the thumb-bolt an arm is attached which raises and lowers a piece of metal that slides behind the yoke of the latch. When this piece of metal is down it passes over and securely stops the keyhole. At the same time it serves to lock in place the latch and the bolt. The advantage of this form of construction will be readily ap-

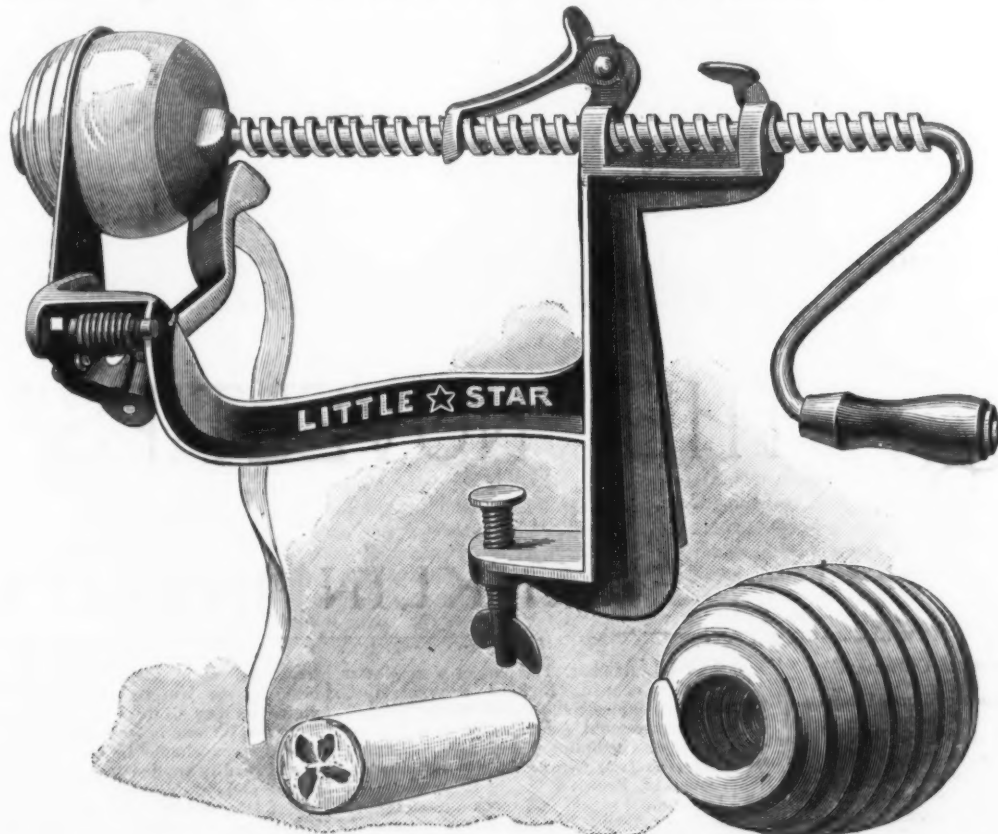
perceived. The illustration which we give below represents the "Little Star" Apple Parer, manufactured by C. E. Hudson, Leominster, Mass., for whom the Livingston Horse Nail Company are agents, 104 Reade street, New York. This machine is, as indicated, a parer, corer and slicer, and the general method of its operation will be readily understood by reference to the illustration. A point in its construction on which special emphasis is laid is that the parings drop clear of the machine, thus obviating a difficulty which is found with most other machines.

## The "Little Star" Apple Parer.

The illustration which we give below represents the "Little Star" Apple Parer, manufactured by C. E. Hudson, Leominster, Mass., for whom the Livingston Horse Nail Company are agents, 104 Reade street, New York. This machine is, as indicated, a parer, corer and slicer, and the general method of its operation will be readily understood by reference to the illustration. A point in its construction on which special emphasis is laid is that the parings drop clear of the machine, thus obviating a difficulty which is found with most other machines.

## The Globe Jelly, Fruit and Wine Press.

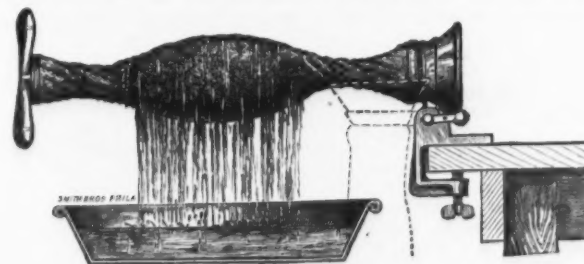
The illustration given herewith shows this article, which is made by the Globe Mfg. Co., 926 Walnut street, Philadelphia, who are represented in this city by W. H. Caughey, 71 Fulton street. It is described as consisting of a finely-knitted textile bag of peculiar construction, one end of which is provided with a handle and the other secured to the rim of the feeding funnel, which is detachably hinged to a frame clamped upon the table. In using the bag



The "Little Star" Apple Parer.

and handle are allowed to hang down, as indicated by the dotted lines; the fruit is then poured into the bag through the funnel; then the handle is turned, twisting both ends of the tube or bag, and the press is held in a horizontal position to express the juice, as shown in the cut. The funnel is then disconnected from its frame and the contents of the bag discharged. The manufacturers allude to the liability in perforated-metal presses of the holes to become clogged in time, besides the fact that they are apt to permit solid matter to find its way into the

manner or for a purpose contemplated by the makers. We cannot listen to the words of the contract as to the use intended. The machine did not, by appearance or label, indicate the use to which it was applied. Can there be any negligence in fashioning an inert mass of iron in such a manner that a subsequent possessor may so use it as to make it dangerous? Or can there be negligence in a maker permitting such an article to pass from his possession? The article might be of some value as old iron or as a receptacle of matter not under pressure.



Globe Jelly and Wine Press.

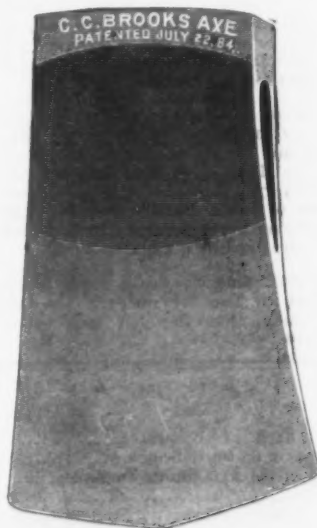
juice, and they make the point that the advantages of the regular flannel bag are obtained in this press without the liability of the hands to become stained from the juice, as by the old method, while very much increased power is obtained for the expression of the juice.

## The Responsibility of Builders of Machinery for Accidents.

In the recent case of *Osten vs. Morris*, involving the responsibility of builders of machinery, Judge Yerkes, of the Common Pleas Court, Philadelphia, decided that "even where there is negligence in a maker of a machine he is not liable to a third person for an injury received while the machine is being operated by a purchaser, unless the act of defendant was the proximate cause of the injury." The opinion contains the following review of the case: The defendants, iron manufacturers, contracted with the Beacon Gas Light Company to make a gas receiver which should be able to stand a pressure of 600 pounds to the square inch. The receiver was delivered, and exploded upon the first day of its use, and a flying piece killed the husband of the plaintiff, who was at work in premises adjacent to those where the machine was located. It was alleged that there was an imperfect welding of the head to the body of the receiver; that there was a burning of the iron so that it could be seen

Yet if the principle contended for is true, the defendants would have been liable if they had sold as old iron or as such receptacle. The only difference between our case and this hypothetical case is in the contract of sale, and, as that is not between the parties in the suit, it must not be considered. Excluding the contract, no sufficient evidence of negligence was offered. Where there is negligence in a maker of a machine, he is not liable to a third person for an injury received while the machine is being operated by a purchaser.

**The Deepest Borehole.**—The deepest borehole in existence, according to a paper read by Herr Mohs before the Magdeburg district association of the Society of German Engineers, is that reached in borings for coal near the village of Schladebach, on the railway between Corbetta and Leipzig, which have been made for some time in that locality at the instance of the Prussian Mining Department. The total depth of this borehole, which has been driven with a hollow diamond-pointed rock drill and water flushing, is 4,559 feet. Its diameter at the bottom is 1.872 inches, and at the surface 11 inches. Boring operations have been carried on for three years and a half, and a sum of £5,000 has been spent in reaching the depth attained. The temperature in the lower portion of the borehole was found to be 48° C., equal to 118.4° F.



The C. C. Brooks Axe.

This article was patented in Canada July 3, 1884, and in the United States July 22, 1884. Its peculiar form is shown in the cut, which represents as the most distinguishing feature the angular edge of the bit. This shape of the bit is described as giving to the axe a shear or draw cut, making it cut easier and



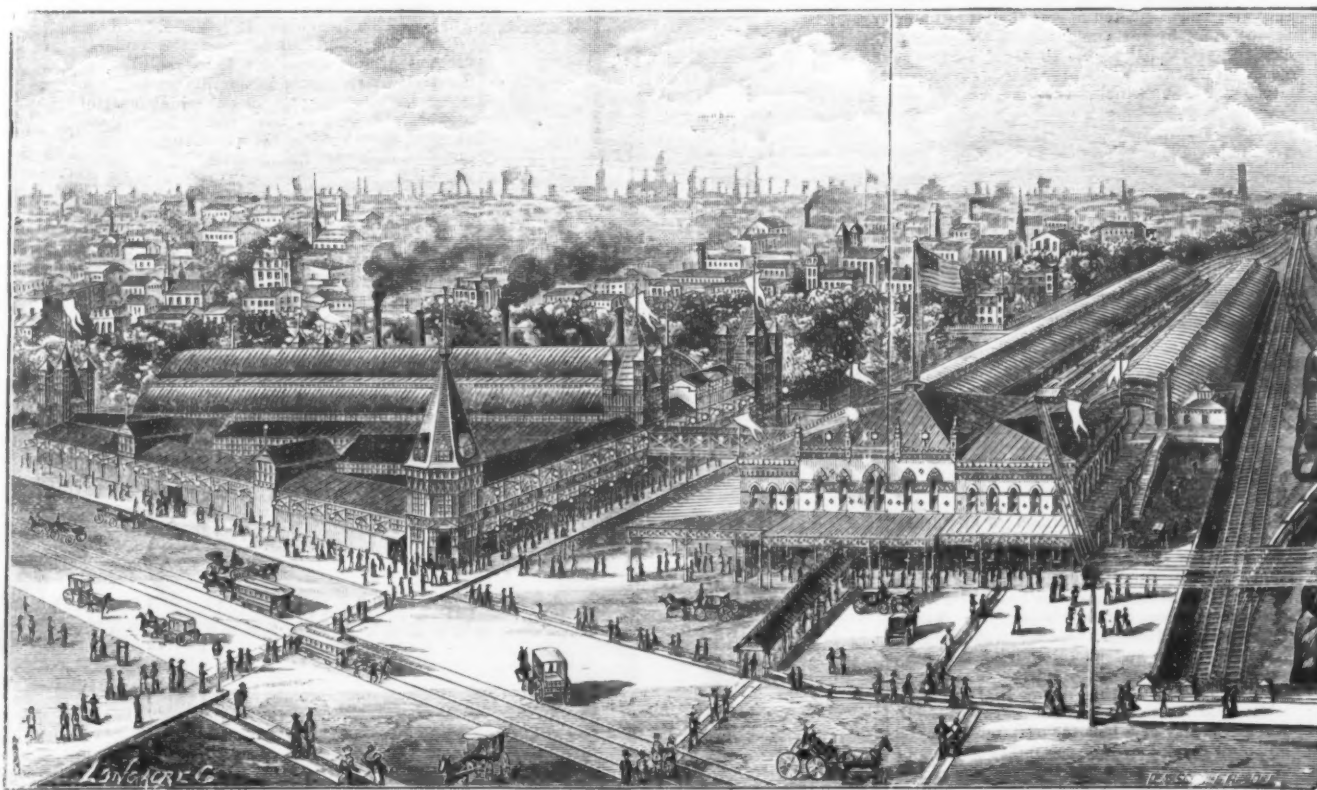
# THE "NOVELTIES" EXHIBITION

OF THE

## FRANKLIN INSTITUTE, PHILA.

OPENS  
Tuesday, Sept. 15.

THIS  
EXHIBITION  
WILL AFFORD  
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an excellent opportunity  
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TO  
Public Notice.



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BLANK FORMS OF  
APPLICATION,  
and  
all other  
Information,  
ADDRESS  
COMMITTEE  
on  
EXHIBITION.

# THE "NOVELTIES" EXHIBITION

OF THE

## FRANKLIN INSTITUTE, PHILA.

### Moving a Chimney.

The large chimney of James Riley's tannery at Salem, Mass., was successfully moved to a new location in the tannery yard recently. The chimney is 90 feet high, and at its base measures 6½ feet in diameter, while at the top the diameter is only 1½ feet less than the base. It weighs about 130 tons, and contains 70,000 bricks. Six men and two horses were required to perform the service.

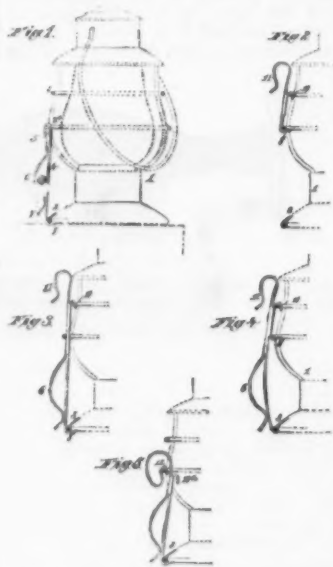
According to the Boston Journal of Commerce, the first duty performed in moving the chimney was to build a solid foundation for it to rest upon, so that it might be ready to safely start on its journey, which, though short (100 feet), was attended with much labor and a certain amount of danger, for, should the brick tower settle 3 inches or become that much out of perpendicular, an immediate collapse would follow. Having built a foundation, which was to form a prominent part of the "carriage," out of heavy planks 9 x 10 inches in thickness, and placed it in readiness for the chimney to rest upon when the bottom of its brick base was removed, the next work was to build supports or braces extending up the sides a distance of 23 feet. They were erected on the back and front, slanting, and fastened at the top with iron rods which held them in solidly. The planks at the bottom were also fastened securely with iron. The outside carriage was thus formed, running from the side of the brick and slanting to the timbers which formed a rest at the bottom. As an additional support another carriage was built on the inside of the outer carriage in a similar manner, thus affording double strength, then extending up the sides of a chimney a distance of 16 feet. Then the workmen began to make an opening in the base of the chimney, through which four large planks were shoved at each side, giving a support under which 34 jacks were placed. The brick structure was then slowly raised, with the carriage support, giving an opportunity for securely arranging the platform and rollers on which the chimney was to be moved. A platform or staging was constructed to form the side for the new location. This staging was then made perfectly level, and the task of moving commenced. This was accomplished in the ordinary manner of moving a building on rollers, with the exception that two windlasses and a larger number of rollers were required than in the above working, thereby preventing any jar. Slowly, but surely, the chimney moved toward its resting place, and it was finally settled at the new site.

Instead of the removal of any works from St. Louis, it now appears to be probable that Ohio capitalists will operate one of the largest of the St. Louis plants, viz., the Vulcan Works, now in the hands of the receiver of the St. Louis Ore and Steel Company. The representatives of the companies, who were in St. Louis during last week, after beginning negotiations looking to the close of the lease, deferred further action until July 6, so that certain legal requirements may in the meanwhile be complied with by the Brown-Bonnell Company, whose corporate powers, it is stated, do not at present include the entering into contracts of

the kind intended. The parties were Messrs. L. E. Cochran, Richard Brown, H. C. Bonnell, James Nelson and Henry Weeks—and represented Andrews Bros. & Co. and Youngstown Rolling Mill, of Youngstown; Jefferson Iron Works, of Steubenville, and Cleveland, Brown & Co., of Cleveland, Ohio. The annual rental said to be agreed upon is about \$70,000, being amount of interest on bonds and fixed charges against the property. It is reported that a chemist formerly employed by the Vulcan Works has been employed, and that the production of steel billets for rails and other manufacture is intended.

### Green's New Patent Lantern Holder.

This device, patented June 2, 1885, is for securely holding and suspending lanterns used on railways, vessels, &c., and is illustrated in the accompanying cuts.



Green's New Patent Lantern Holder.

Fig. 1 shows a holder adapted for use on freight trains, by means of which the brakemen are enabled to instantly secure their lanterns from sliding about and thus losing them. This is done by pressing the hook down over the hand rails on the tops of the cars. They are as quickly detached by lifting the lantern. When not attached to the lantern this device may be carried without inconvenience in the pocket. Fig. 2 represents a device constructed for suspending lanterns from the rails on the ends of the cars or on ladder rounds, the rigging of vessels, &c., its special features being plainly indicated in the cut. Fig. 3 is a double holder, possessing the combined advantages illustrated and described in Figs. 1 and 2, and intended to hold the lantern either when standing upon its base or in a suspended position. Fig. 4 is a variation in the construction of Fig. 3. Fig. 5 is an adjustable device to overcome

irregularities in the distance between the base of the lantern and the lower iron guard, as may occur in the various makes of lanterns. These holders are, it will be perceived, very simple in their design, easily made, readily applied to lanterns, and light, strong and durable. They are made preferably of thin spring sheet brass. As appears by the announcement on page 26 of this issue, the patent covering these devices is owned by Mrs. F. L. Green, of Hartford, Conn., who offers it for sale.

The Bemis & Call Hardware and Tool Company, of Springfield, Mass., have patented a wrench which is adapted to serve as a monkey wrench and also for grasping pipes and similar cylindrical objects. The stationary head of the wrench projects toward the right and left, one portion being a plain wrench jaw and the other portion a corrugated pipe jaw. The movable jaw is made in two separate parts, both of which are moved by the same nut. The movable jaw for the plain wrench is made with yokes which snugly fit around the wrench-bar, and thus cause the jaw to move in a right line. The movable pipe jaw, on the other hand, has yokes which fit the bar loosely, to permit a slight oscillation of the jaw and thus effect a cam grip on the pipe. A spring bearing against one of these yokes has a tendency to throw this jaw away from the bar. This spring is compressed when the jaw is screwed up against the work.

On the 26th inst. the Cleveland Rolling Mill Company filed papers in a suit in United States Circuit Court, St. Louis, against the Texas and St. Louis Railroad Company and 19 of its stockholders residing in St. Louis, to enforce the collection of a judgment for \$80,235, resulting from breach of a contract for steel rails.

Jere Abbott & Co. (Austin Wheelock), of Boston, on 24th inst., brought suit in United States Circuit Court, at St. Louis, against Curtis & Co. Mfg. Co., on four notes amounting to \$2763.77. Defendants, who are manufacturers of saws, claim an offset of an amount of over \$7500, resulting from defective steel furnished by plaintiffs.

The Passaic Zinc Works, in Jersey City, were closed on Tuesday, owing to the dullness of trade, throwing 200 men out of employment.

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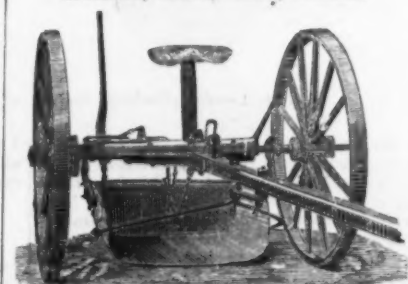
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ALFRED F. BHAINERD,  
ANALYTICAL CHEMIST AND  
MINING ENGINEER,  
Birmingham, - - Alabama.

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## THE WEEK.

Professor Egleston says that the obelisk in Central Park is undergoing decomposition, due entirely to the fact that it was brought from a dry to a moist climate. He gives it as his opinion that unless the obelisk is placed under shelter in some museum it will within 15 years be decomposed beyond repair. The Park Commission, on the other hand, fail to observe any evidence of disintegration.

An old abandoned salt well at Syracuse is once more sending out a strong flow of brine testing 78°.

Ferdinand de Lesseps contemplates having a large dry dock built 2½ miles from Panama, for the benefit of vessels passing through the canal when the latter is finished.

The Commissioner of the Bureau of Statistics of Labor of this State has sent out blanks for three inquiries in the interest of wage-workers. One relates to the employment of women and girls in manufacturing and mercantile establishments, with a view to ascertain what effect, if any, such employment has upon the physical development of those so employed. Another inquiry is in regard to the causes and effects of the numerous strikes during the year beginning November 1, 1884. The third inquiry is in regard to the "truck system," said to prevail to a greater or less degree in the manufacturing centers of the State, by which workmen are partly paid in goods and partly in cash.

The sugar-cane crop of the Sandwich Islands having suffered from the ravages of rats, 36 pair of mongoose were introduced from Jamaica, clearing several thousand acres of these pests, and the proprietor of one plantation in Hilo estimates the saving in his cane equal to \$50,000.

A prominent Canadian official now in London is making an earnest effort to obtain State aid for intending emigrants.

The United States Government are invited to send a representation to an International Congress of Commercial Law, to be held in Antwerp in September, and the New York Chamber of Commerce will nominate a suitable man for indorsement by the Department of State.

A dispatch from Yokohama announces that the Pacific Mail steamer City of Tokio is on the rocks near that port, and is likely to go to pieces. She is a four-masted screw vessel of 5000 tons, built by John Roach & Sons in 1874, and is valued at \$300,000.

Last week the New York Adjustable Stern Dock Company, of this city, placed one of their floating coffer dams under the United States cruiser Atlanta at the Morgan Iron Works. This dam saves the expense of putting a vessel on the dry dock.

Capt. Ambrose Snow, president of the Board of Pilot Commissioners, takes a great interest in the efforts being made to improve the channels in the harbor of New York. He says that Gen. Roy Stone's submarine plow will work splendidly in any river where the current is constantly running in one direction, but where there is an ebb and flow the sand is not carried far enough away.

The foreign steamship inspection required under the laws of the United States has outlived the period of opposition, its requirements being found much less onerous than the companies had feared.

Mr. Edison announces a new device intended to permit engineers of railway trains to communicate easily with one another when the trains are a mile apart and in motion. The medium of communication is the telegraph wires along the railroad and an instrument in the engineer's cab.

Minister Osborn, at Buenos Ayres, acting in accordance with instructions from Washington, has concluded a contract securing to the Central and South American Telegraph Company a concession to establish cables between Buenos Ayres and Rio de Janeiro, and land lines between Buenos Ayres and the Pacific side, thus securing continuous and independent telegraphic communication between the United States and Brazil.

Articles of incorporation have been taken out by the Union Passenger Railway and Transfer Company, a corporation which claims a capitalization of \$11,000,000, and, if the road is built as planned, its tracks will gridiron the city from Harlem to Wall street, running through several streets north and south and frequently crossing the city from east to west. The directors named for the first year are William H. Kemble and William L. Elkins, of Philadelphia; Edward Sellick, George Terry, William Parr, Henry Thompson and John F. Schooley, of New York.

In British Columbia the authorities are enforcing the provisions of the statute in prosecuting parties employing Chinese who have not obtained license.

Ex-Minister Daggett, of the Sandwich Islands, is on his way to Washington, and is supposed to bear a commission looking to the opening of negotiations for the annexation of the Islands to the United States.

The London Telegraph discusses the propriety of elevating the American Legation in that metropolis into an embassy. To many

Englishmen it has long seemed an anomaly that the minister of the United States in England should rank with those accredited to the Court of St. James by Hayti, Servia or Japan, or that he should be inferior in status to the ambassadors of France, Germany, Turkey, Italy and Russia.

A syndicate of capitalists in Mercer County, Pa., recently commissioned Hon. Earl A. Wheeler to visit England to confer with Alfred Davy, inventor and proprietor of the Davy process of steel manufacturing, and inquire into the feasibility of erecting large steel works on that plan in the locality of Sharon.

The Florida Fruit Exchange, just opened in Jacksonville, expect by combination to materially promote the interests of the trade.

Sewing machines under the new Mexican tariff, which went into effect on the 1st inst., are transferred from the free list to the regular customs schedule which fixes a duty on them of 5 cents a kilogram, whereas they lately were subjected to the merely nominal impost of 50 cents per 100 kilograms, a duty placed on all machinery.

German manufacturing industries languish. The spring business was a decided disappointment, and the summer thus far has shown little or no improvement in the situation.

Respecting the commerce of the Siamese, Minister Halderman, at present at home on a furlough, remarks that the people are very favorably inclined toward Americans, and there is a possibility of foreign trade becoming important. The Siamese are agriculturists. The chief exports are rice, sugar, pepper, Japan wood and hides. China carries on a larger trade with Siam than any other country.

Considerable alarm is felt in England on account of the dispatch of a German squadron with the alleged design of punishing the Sultan of Zanzibar, whose dominions form the gate of the lake region of the interior, from whence all recent expeditions have taken their start. It is the commercial enterprise of British subjects, according to the London Times, which has raised Zanzibar to its present condition of prosperity. Its trade with England and its dependencies now amounts to \$5,000,000 annually, and there are at present 6000 British subjects in Zanzibar itself, while not less than 16,000 others are scattered throughout the Sultan's dominions. The latter is charged with wrongfully asserting sovereign rights over adjoining territory recently acquired by the Germans. But it is suggested that Germany will not make a very auspicious beginning for her East African undertakings if she quarrels with the only African potentate who has shown a capacity to aid and a disposition to encourage European intercourse and enterprise.

The old war ship Niagara, now being broken up at the Charleston navy yard, yields 171,226 pounds of copper, 61,369 pounds of composition, 486 pounds of wrought iron, 646,000 pounds of cast iron and 18,000 pounds of lead.

The first official step to carry out the provisions of the recent act to enforce the law for placing the electric wires underground has been taken by Mayor Low, of Brooklyn, who has appointed G. W. Plympton, Rositter W. Raymond and John Reynolds commissioners to determine the best manner of constructing the subways. Mayor Grace is believed to have selected a suitable man for a like object in this city.

The railroads of Chili in the year 1883 earned a revenue of \$5,516,049 on a capital of originally less than \$60,000,000, and which is now reduced to \$22,450,000.

The prospective cotton crop is stated by the Baltimore Manufacturers' Record to be remarkably promising. The general average is said to be higher than in June, 1882, 1883 and 1884. Now, the acreage in 1882 was 16,276,000, and the crop 6,949,756 bales, or an average of .42½ per cent. of a bale per acre for the whole South. The acreage for this year, however, is over 18,000,000 acres, or 1,800,000 acres greater than in 1882. Should the final yield per acre be as good as in 1882—and the present condition, be it remembered, is better than in June of that year—the cotton crop of 1885 would be about 7,676,000 bales, or over 700,000 bales more than the largest crop that has yet been produced. If the yield should average .45½ per cent. of a bale an acre, as in 1880, the total crop would be nearly 8,200,000 bales, while if it should only reach the general average of the last 15 years—.39½ per cent. of a bale—the crop would still be a little over 7,000,000 bales.

In the United States Court, in this city, on Friday of last week Judge Benedict refused the application of James D. Fish, the defaulting president of the Marine Bank, for a new trial. The point raised by the defense was that Fish's advances to Ward were simply loans, which he had authority to make. The court admits that the president of a national bank is vested with power to loan money between the meetings of directors, and that, however imprudent his action may be, it is not, if done in good faith, a misappropriation of the funds of the institution. But, says the court, "a loan of money of a bank by the president in bad faith, for the purpose of defrauding the bank, is no loan in the

sense of the law. It is simply a fraud." Fish was sentenced to 10 years in State Prison.

The London Geographical Society is mapping out another African expedition to start in August next from Zanzibar and advance to a point 700 miles distant, via Lake Shirwa.

The Commercial Cable Company, of this city, which has 14 wires underground within the corporation limits, has thus far worked the lines without difficulty.

The Sinking Fund Commissioners of New York, in seeking to provide adequate water supplies for the dry-goods district, propose to build storage tanks or reservoirs in that locality. They claim to have discovered a water-bearing stratum at a moderate depth below the surface from which can be secured a supply of about 5,000,000 gallons of fresh water daily.

The lively manufacturing town of Paterson, N. J., now has a population of 62,722, an increase in five years of 11,700.

A baronetcy has been conferred upon Isaac Lowthian Bell, the well-known ironmaster of the North of England, and one of the leading authorities in England on blast furnace practice.

Dr. James P. Kimball, of Bethlehem, Pa., the newly-appointed director of the mint, is professor of economic geology in the Lehigh University, a mining engineer and metallurgist by profession. He was educated at Harvard University and at the Mining School of Freiberg, Saxony, and is now president of the Everett Iron Company of Pennsylvania.

A step forward in the silk industry is the establishment of a silk-reeling school in San Francisco by the State Board of Silk Culture.

The sharp competition between the Southern Pacific and other railroads running into New Mexico and Arizona has had the natural result of reducing freight rates, the cut in many cases being as high as 40 per cent.

The incorporators of the North, Central and South American Expedition met in New Orleans 27th ult., and elected the following officers: Samuel B. McConico, president; R. G. Howard, first vice-president; George L. Shoup, of Idaho, second vice-president; S. H. Buck, director-general, and Richard Nixon, secretary.

It is affirmed, apparently with truth, that the retiring collector of the port of New York, Wm. H. Robertson, during the four years of his incumbency collected nearly \$600,000,000 of revenue. Meanwhile the cost of this collection to the Government has not only been less than for any preceding four years, but for the last year it has been ¼ of 1 per cent. less than for any previous year in the history of the office.

M. Waddington, the French ambassador to England, announces that France, without waiting for the ratification of the treaty of peace with China (which was signed on the 9th of June), has issued orders to all French commanders to raise the blockade of Chinese ports and to cease searching vessels on the high seas, and that trade may be resumed on the same conditions as before the war.

The census enumeration for Iowa is likely to reach 2,200,000, a gain of 600,000 in five years.

M. de Lesseps, in conversation with a journalist the other day, said he was convinced that unless England withdrew from Egypt the Egyptian dispute would end in an Anglo-French war. England, on the other hand, is sending out additional military accoutrements and supplies, apparently with the design of holding on.

The Postmaster-General listened to delegations from various steamship lines, who urged their claim for the distribution of \$400,000, appropriated by the last Congress for carrying the United States mails, but replied that he saw no reason for changing his previously-expressed views on this subject.

The circulars from the Secretary of the Navy, calling for the plans and proposals for four new cruisers, specified that they should be submitted by July 15. The Bureau of Construction and the Bureau of Steam Engineering of the Navy Department will submit plans for all the vessels, the former for the hulls and the latter for the machinery and engines. Several plans for a single vessel will be submitted by naval officers, and it is expected that plans will be received from shipbuilders. Naval Constructor Mintoyne, of the Brooklyn yard, will furnish plans for three vessels. The first is to cost about \$1,500,000, to be 356 feet by 48, to run 18 knots per hour. Her armament will consist of 27 guns, and she will carry about 400 men and officers. The second vessel will be 325 feet by 46, and her battery will consist of 18 guns. The third vessel will be 225 feet by 36 feet, carrying an armament of 14 guns. The vessels are modeled after the English cruisers.

It is estimated that 2500 places of business, including shops and factories, were closed at 1 p.m. last Saturday, affording 50,000 persons unwanted opportunities for recreation.

In the Dominion House of Commons, last week, Sir Richard Cartwright moved a resolution setting forth the increase in the expenditures, taxation and debt, and declaring that stringent measures should be taken

to reduce the expenditure, and to lighten, as far as possible, the burdens of the people. The resolution was defeated by a vote of 79 to 42.

The South American Commission authorized by Congress was on May 16th at Montevideo, having recently visited Santiago and Valparaiso, but with what resulting advantage to commercial interests in the United States is questionable.

Edward A. Boyd, the glass importer, is sentenced to two years' imprisonment, and \$30,000 worth of plate glass consigned to him has been forfeited to the Government. The Government has also begun civil suits against him for the recovery of \$75,000.

The importations of wine into the United States declined both in quantity and in value from 1875 to 1878, which was a period of financial depression similar to the present. The revival of business in 1878 started an increase in the supply, which culminated in 1883. Last year showed a sudden drop to about the figures of 1880, and doubtless the current fiscal year will show one still larger.

The National Cotton Convention will convene in White Sulphur Springs, Va., July 15, and cotton organizations from all parts of the country are expected to participate.

The great bridge in course of construction for the Baltimore and Ohio Railroad Company, to span the Schuylkill at Watson's Island, will be 95 feet above water level. The foreman in charge and representing the Phoenixville Iron Company says that, barring accidents, at the rate the 500 men now employed on the structure are working the bridge will be finished in six months. There has been no accident worthy of note since the curious and perilous imprisonment of several men in a sunken iron caisson some months ago. The material of the structure is iron and Port Deposit granite. Two hundred carpenters and calkers will be put to work to build the caissons, besides the stone-cutters, and when the ironwork is put up between 1500 and 2000 men will be employed in addition.

The Secretary of the Treasury has issued a circular to customs officers, directing the immediate return to the department of all unused blank record books at the different custom houses. The circular says: "Officers are enjoined to hereafter scrutinize requisitions, and to order only such forms (whether books or blanks) and such quantities thereof as are absolutely necessary for official use during the time covered by requisitions. Not only economy in public expenditure should be considered, but the records of an office should be in keeping with and not out of proportion to the character and extent of the business transacted and the actual results obtained. Unnecessarily involved and complicated methods, wherever they exist, should be discontinued, and the simplest and most direct methods consistent with accuracy, dispatch and the best interests of the Government should be introduced."

The Secretary of State has received a report from W. P. Tisdell, United States agent to the States of the Congo Association. Mr. Tisdell traveled by special caravan to the interior of Africa, as far as Stanley Pool. His report is confined to the Lower Congo and coast, with its commercial advantages, and his observations are given for the benefit of American merchants who may feel disposed to locate there. He thinks that, with agencies once established for the sale of American goods and the purchase of native products, a large and well-paying trade could soon be worked up, and that steamers constructed for cargo, with small passenger accommodations, would find profitable employment in monthly voyages from and to the United States via the Azores, Madeira, Canaries, Cape de Verde and the West Coast of Africa.

More anchors are made in Bath, Me., than at any other place in the United States. Hundreds of tons of old iron are bought, the long pieces cut up into short lengths by powerful shears. These small pieces are tied up in bundles, heated and forged into shanks, flukes, palms or rings by the trip-hammers. The anchors turned out sometimes weigh from 50,000 to 75,000 pounds.

Cornelius O'Reilly, architect and builder, of many years' practical experience in this city, has been selected to represent the Real Estate Owners' and Builders' Association in the Board of Examiners of the Building Department, in accordance with the provisions of the new Building law giving to that association a representation in that board. The object of the incorporation of the Real Estate Owners' and Builders' Association is as follows: "To reform the laws, ordinances and regulations affecting real estate and buildings in the City of New York; to secure the safety of life and property by promoting improved methods of construction and building, and for any economical purposes in connection with the above-mentioned object."

The chiefs and commissioners of the bureau of Statistics and Labor began their third annual convention in Boston on Monday. Col. Carroll D. Wright was chosen chairman and Colonel Lard, of Illinois, secretary. The following members were present: Arthur T. Hadley, Hartford, Conn.; L. McHugh, Columbus, Ohio; James Bishop, Trenton, N. J.; William A. Peete, Jr.; Indianapolis, Ind.; Charles F. Peck, Albany,

N. Y.; John S. Enos, San Francisco, Cal.; C. V. R. Pond, Lansing, Mich.; E. R. Hutchins, Des Moines, Iowa, and Frank H. Belton, Topeka, Kan. Addresses were made by Edward Atkinson and Chauncey Smith, of Boston.

The pneumatic postal service in Paris, lately completed, cost over \$200,000, and the length of the pipes is over 34 miles. The charge for transmitting a letter to any place within the fortifications is 3 cents. The service covers extreme points about 7 miles apart.

The Jamaica delegation to Canada, seeking trade reciprocity, had a conference last week with the Quebec Board of Trade. One of the delegates remarked that at one time the trade relations of Jamaica and the Dominion were very close. Now, however, it appeared as if the Canadians were mostly cut out of this trade by the United States. If they were allowed to get their sugar into Canada free of duty they could offer to Canadians a very satisfactory *quid pro quo*. The people of Jamaica proposed to give Canada such advantages over her friend and rival, the United States, as must virtually give her an absolute control of the Jamaica trade, but the home Government do not appear to regard the scheme with favor.

The log crop in Maine is many millions short, the rafts being "hung up" by low water in the rivers.

A bill in the Michigan Legislature abolishing contract labor in prisons was vetoed by the Governor, whose views on this subject have radically changed.

The census of the city of Buffalo, just taken by the police force, shows the total population to be 202,818. The tenth United States census, taken in 1880, gave a total population of 155,134.

Despite all the dullness of business, the California import trade is in volume much in advance of that of 1884. The figures for the past five months were \$15,615,177, as against \$15,200,153 for the same time in 1884. The Hawaiian Islands have taken over one-fourth; Central America more than \$500,000; China, \$447,800, and Japan, \$234,900. As usual, the imports from Pacific ports lead the whole list, those from Europe being comparatively insignificant.

Pittsburgh manufacturers are gratified by a private assurance that the Governor will sign the bill which exempts from taxation the dividends and capital stock of manufacturing corporations. The Gazette says the tax has prevented the organization of many new enterprises and driven capital to other States where the discrimination did not exist. It is believed that the new law will give an impetus to manufacturing throughout the State.

The President has appointed Edward L. Hedden to be collector of the port of New York, Hans S. Beattie to be surveyor of customs and Silas W. Burt to be naval officer. Mr. Hedden was born in New York City in 1828. From 1859 until last year he was a partner in the shipping house of Wetmore, Cryder & Co., and for 35 years conducted the custom-house business of the firm. He is vice-president of the North River Bank and a director in several insurance companies. Colonel Burt, who succeeds Charles K. Graham as naval officer, is now restored to the post which he earned by promotion a few years ago, and from which he was removed by President Arthur. He is now an examiner of the New York Civil Service Board. The annual salary of the collector of the port of New York is \$12,000, and that of the surveyor and naval officer \$8000 each.

Bradstreet's reports as follows the number of failures, with reported and estimated liabilities and assets, in gross, for six months of 1885, as compared with like records for preceding years:

First six months.	No. of failures.	Assets.	Liabilities.
1881.....	3,256	\$19,798,523	\$39,533,705
1882.....	3,649	27,323,775	62,283,269
1883.....	5,296	20,867,202	73,564,306
1884.....	5,444	20,730,078	124,004,357
1885 (partly estimated).....	6,115	33,670,000	70,196,000

Such is the demand for natural gas in Pittsburgh, says the Titusville Herald, that there are already five lines running in there from wells 18 and 25 miles distant; 25,000,000 cubic feet are furnished that single city every day and 10-inch pipes now going down will increase the supply to 40,000,000 feet. No less than 50 mills and factories there of various kinds are now using natural gas.

William Cramp & Sons, the Philadelphia shipbuilders, have contracted with the Plant Investment Company to build a steamer to run between Tampa and Havana. The boat is to be finished by December 1, and it must show a speed of from 14½ to 15 knots an hour. The time from New York to Tampa by rail, and thence to Havana by steamer, under this arrangement, will be 65 hours.

Proposals have been received at the Bureau of Steam Engineering, Navy Department, to supply a 75-ton floating derrick for the Brooklyn Navy Yard. They are: Pusey & Jones, Wilmington, Del., \$60,680; Jacob A. Cole, Brooklyn, N. Y., \$74,440; Harlan & Hollingsworth, Wilmington, Del., \$92,000, and John A. Dialogue, Camden, N. J., \$66,386.

The contract for repairing the revenue steamer Bear has been awarded to Trundy & Murphy, of New York, at their bid of \$17,600.



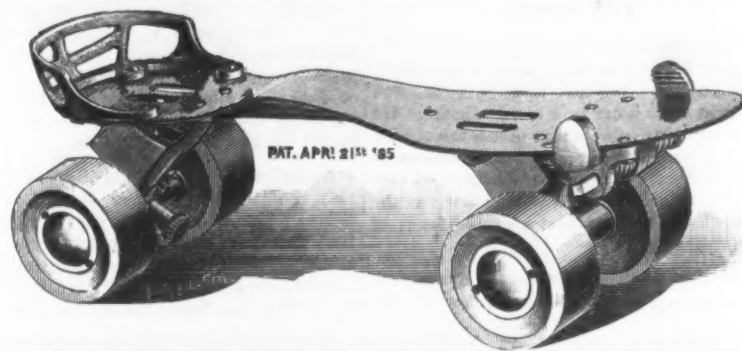
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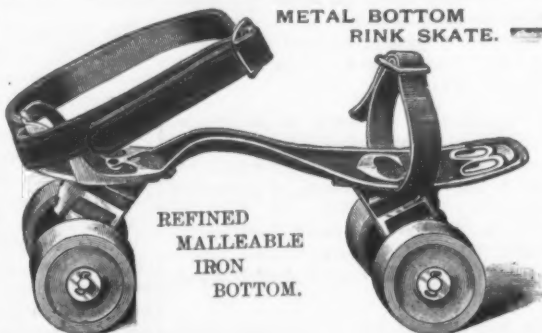
AS A RINK SKATE  
THE PERFECTION  
HAS NO EQUAL  
On account of its  
Fine Movement.



THE LADIES'  
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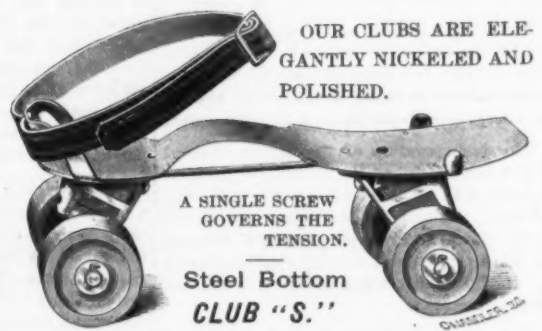
SIZES 1 AND 2 WEIGH  
ONLY 3 POUNDS  
TO THE PAIR.

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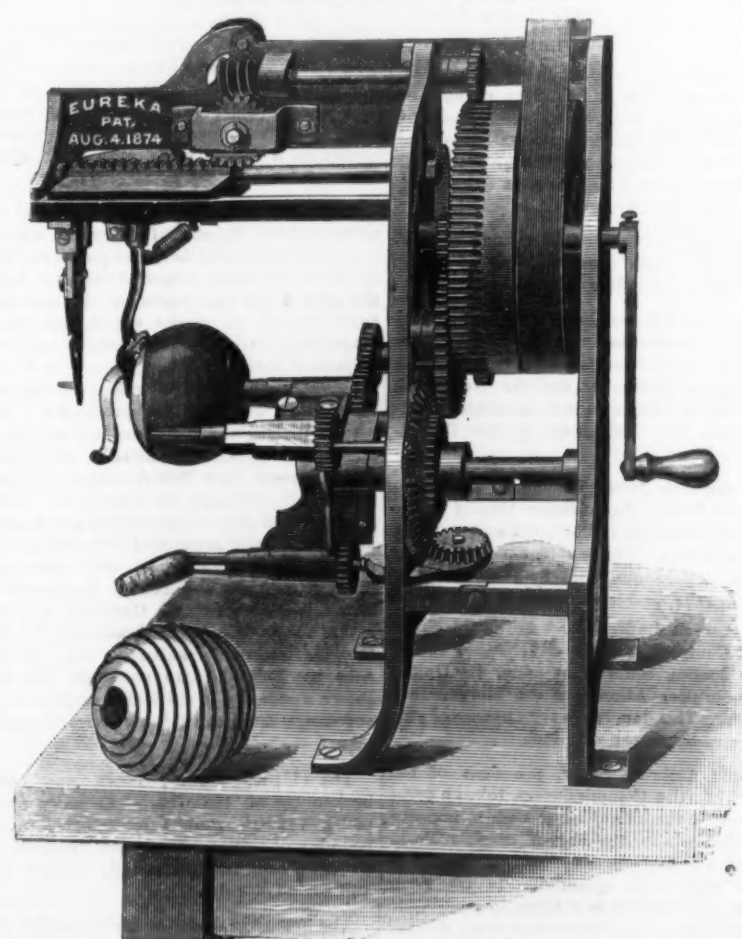
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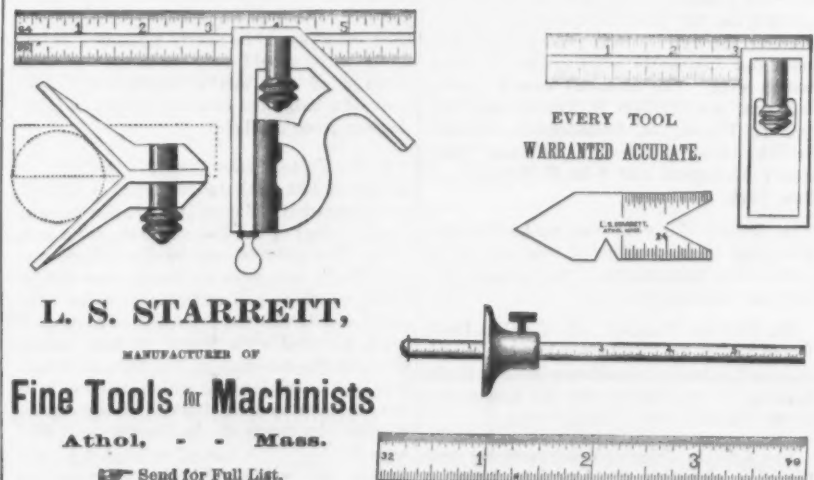
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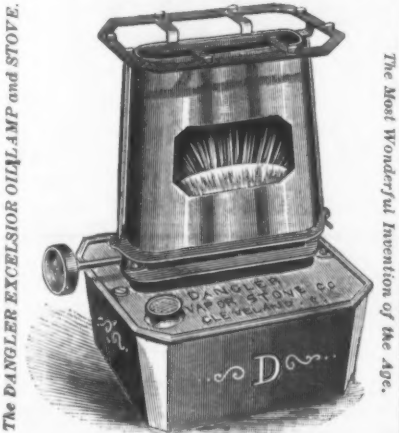
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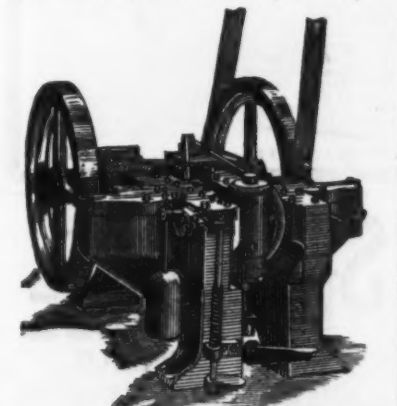
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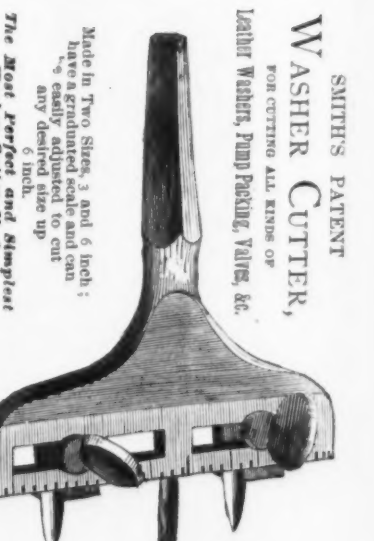
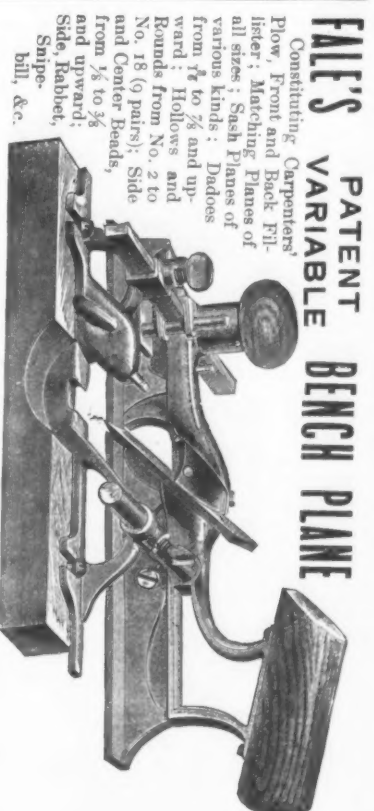
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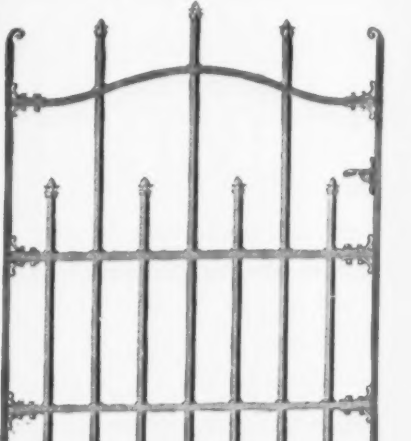
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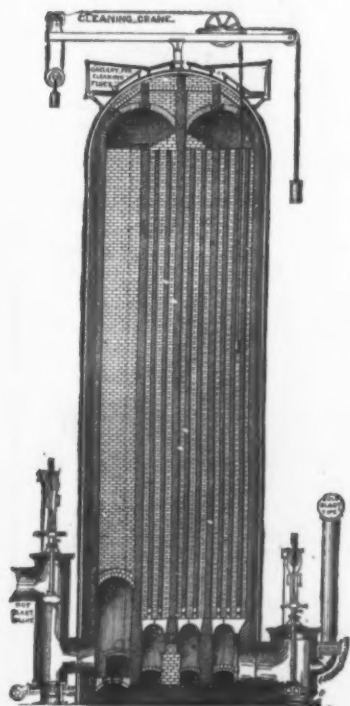
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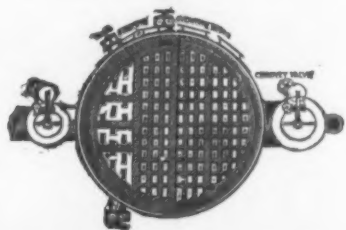
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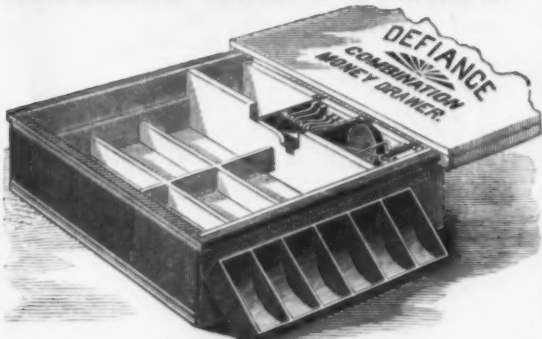
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The Only Safe Drawer in Market. We claim that the Defiance Money Drawer is the best drawer in market. We claim this because, FIRST—The lock is simpler, stronger and more easily changed, and, as the five keys under the drawer work on a system of weights instead of spiral springs, the ones in use do not work easier than the others, thus giving better security and greater durability. SECOND—There are six spaces for bills instead of four, and they are more conveniently arranged than in any other drawer. THIRD—A separate compartment for private papers is afforded. FOURTH—The special till will save fully one-third of the time in making change. The six compartments are all together, on a line, so that the drawer need be opened only four inches, and the bill compartments are not exposed. FIFTH—The material, workmanship and finish are equal to the best. Also sole manufacturers of Knight Cheese Safes, Perfected Oil Tanks, Excelsior Belt Pails, "Knock Down" Broom Racks, &c.

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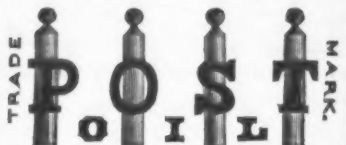
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WATERPROOF  
BELT OIL

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LEATHER  
PRESERVATIVE,

For Wet and Dry Leather  
Belting.



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THE  
STANDARD BELT OIL  
OF THE WORLD.

Leather dressed with this oil will not crack or rot, as heat, cold, water or gas has no effect on it. It will spread one third further and last much longer than any oil for the same purpose. It never turns rancid; will keep in any climate. Belts may be run in water at one end and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue-laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

Beware of Imitations Sold at a Cheaper Price, the Color of which is well calculated to Deceive.

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"Care should be taken that belts are kept soft and pliable. For this purpose we decidedly advise the use of 'POST'S WATERPROOF BELT OIL AND LEATHER PRESERVATIVE.' When applied as DIRECTED, it makes the Belt smooth pliable and adhesive and causes it to hug the pulley closely, so that no power is lost from lack of pulley contact. It possesses excellent preservative qualities and also renders the leather more impervious to dampness than any article or preparation we know of."

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If you cannot get POST'S OIL from your Belt Maker, send direct to us and we will see that you do get it.

Price, Per Gallon, \$1.50.

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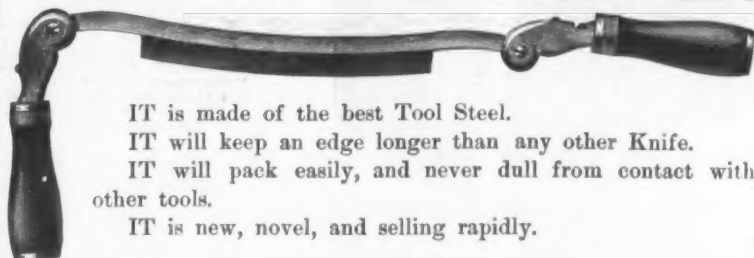
No. 10 Peck Slip, N. Y.,

SOLE MANUFACTURERS.

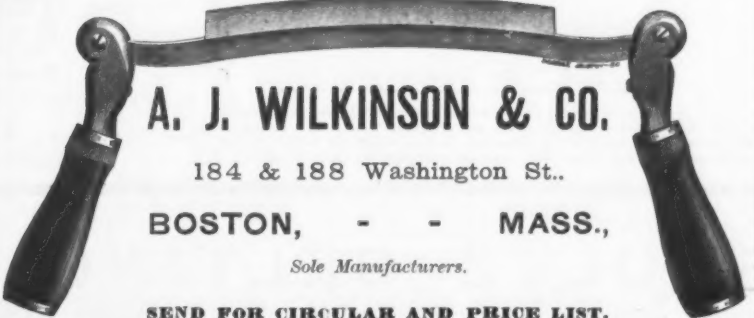
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IT is new, novel, and selling rapidly.



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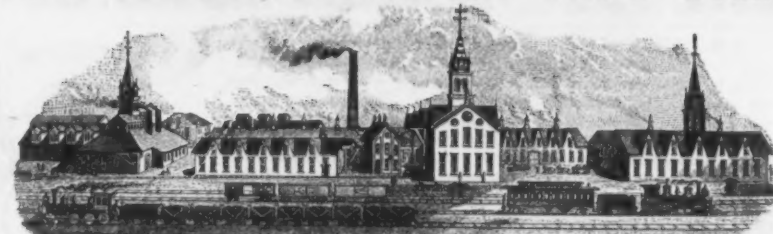
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Centennial Award. "Superior in Every Respect." This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

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Steel-Toothed Coal Breakers, Bradford's Coal and Ore Separators, Air Compressors and Rock Drills, Stephen's Planer Chucks, Air and Steam Hoists, Winding and Cornish Pumping Engines, Mining Machinery and Fans, Emery Grinder Stands, Engines, &c., of all descriptions.

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**TAMAQUA, Schuylkill Co., PA.**



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The Largest Rubber Works West of New York.



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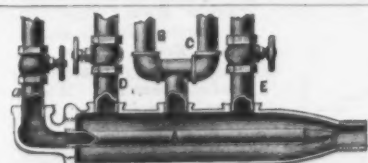
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## Henley Spring Steel CLUB SKATE.

**THE**  
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Will stop all snapping and cracking noises in steam pipes; increases heat in dry rooms. The only Fitting in the world that will do it. It is worked by steam after passing through the heaters.

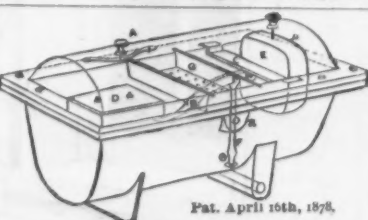


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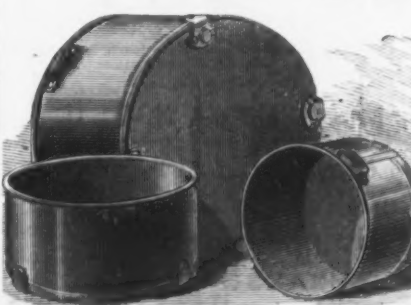
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ATTACHABLE TO OLD AS WELL AS NEW BLINDS ON FRAME OR BRICK HOUSES.  
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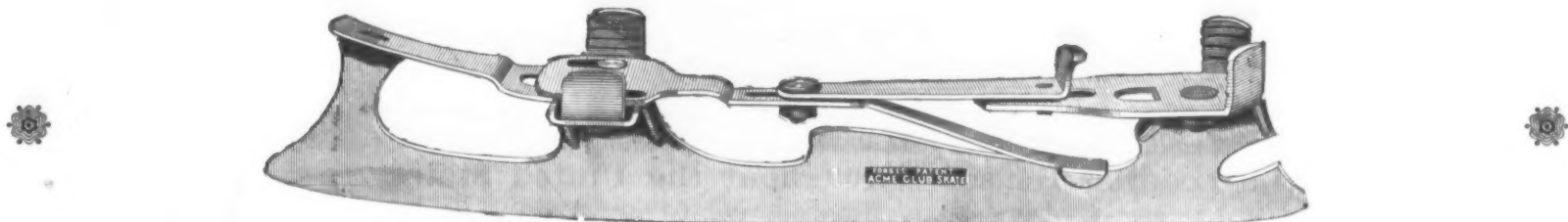
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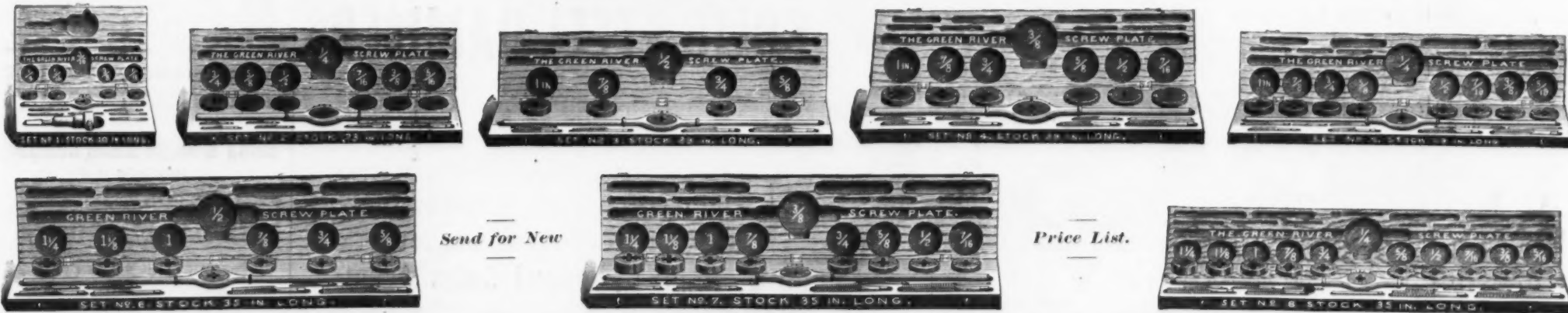
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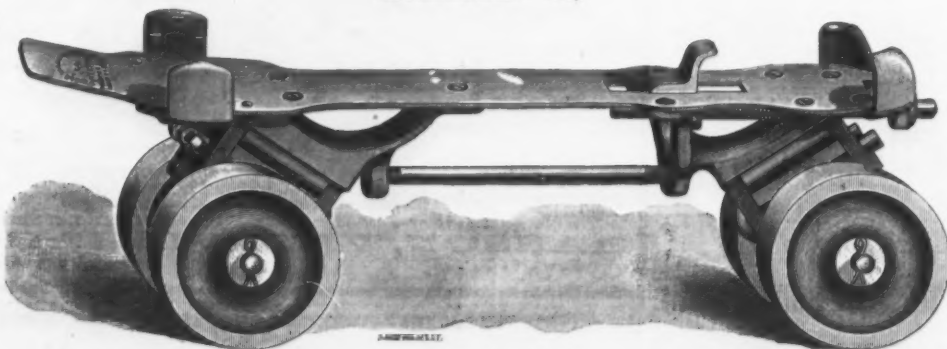
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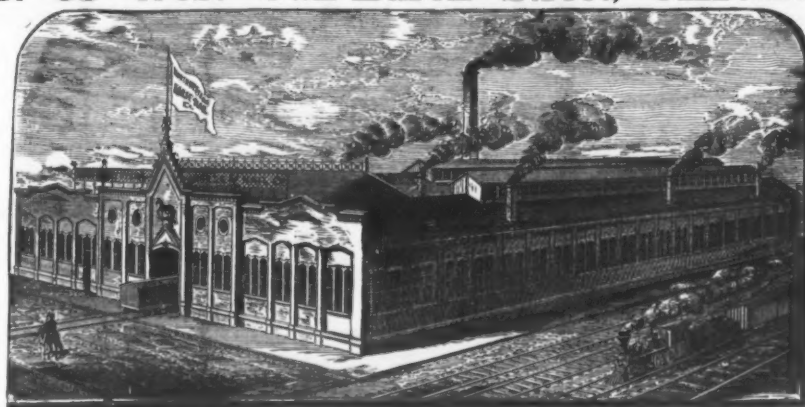
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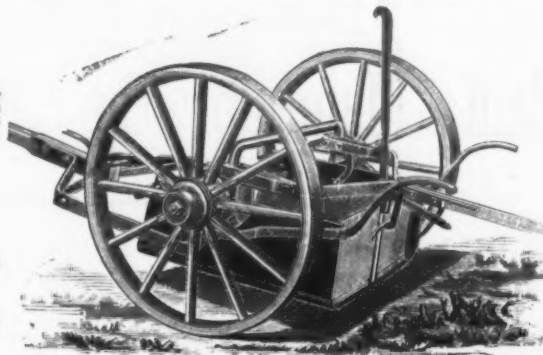


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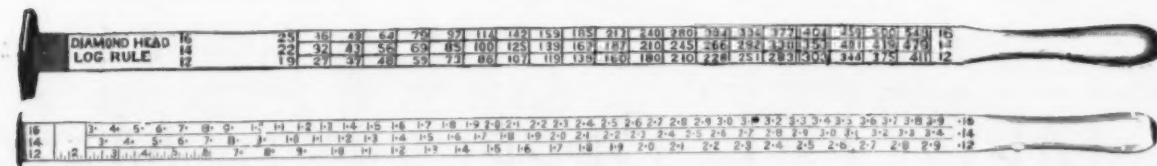


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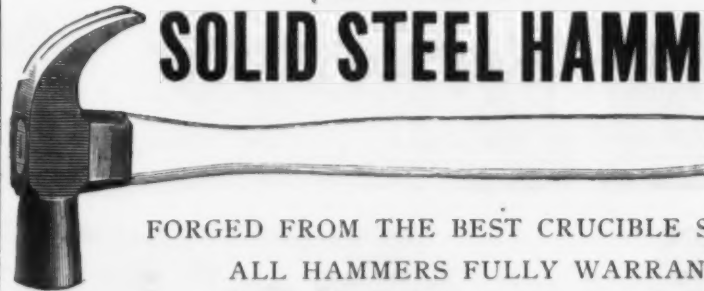
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ALL HAMMERS FULLY WARRANTED.

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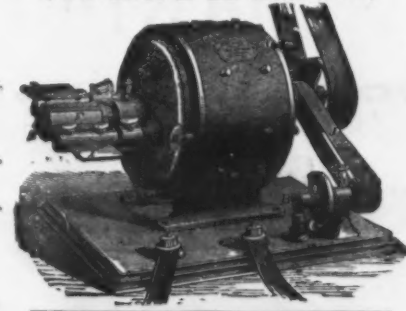
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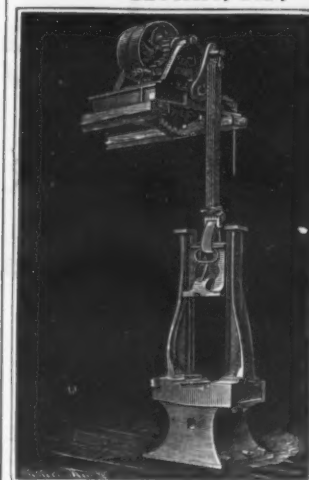
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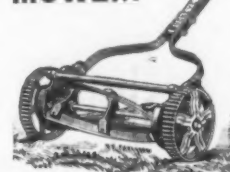


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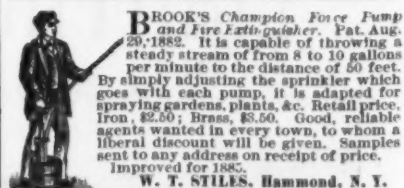
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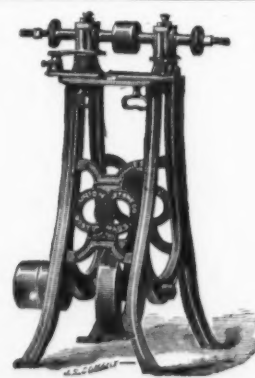
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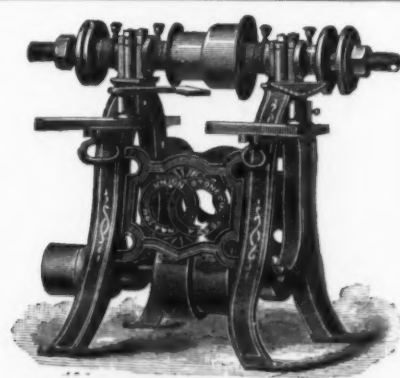
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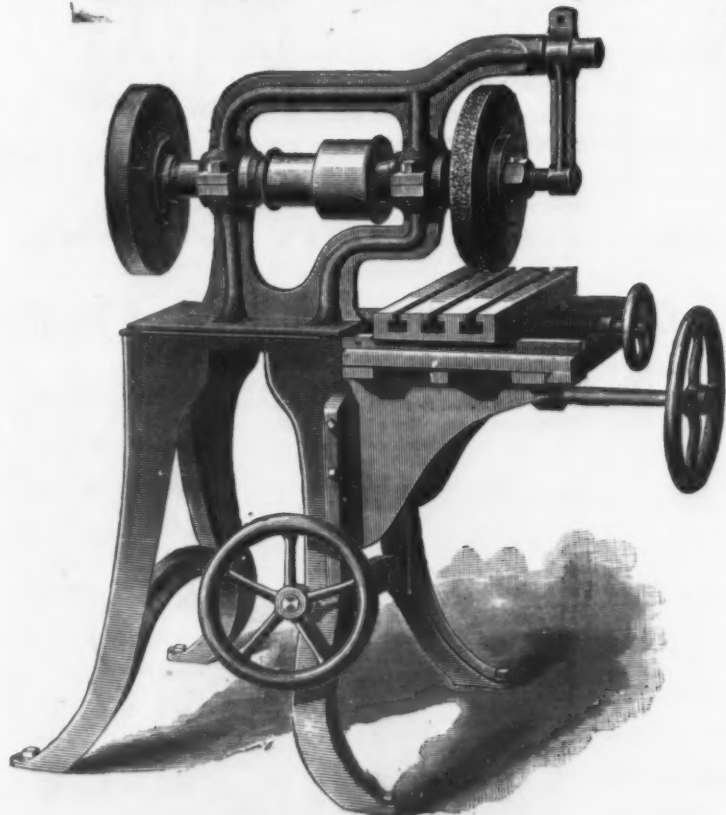


B Machine has 1 1-2 in. Arbor.

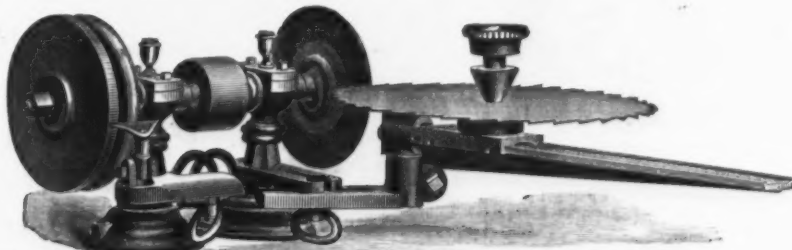


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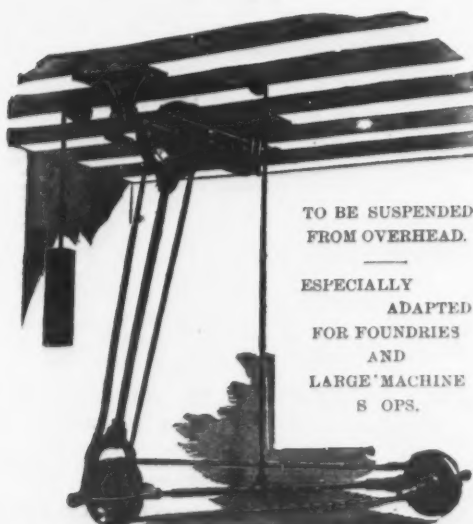
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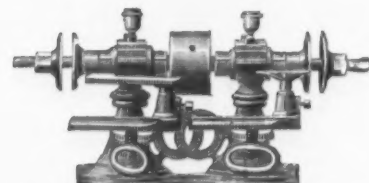
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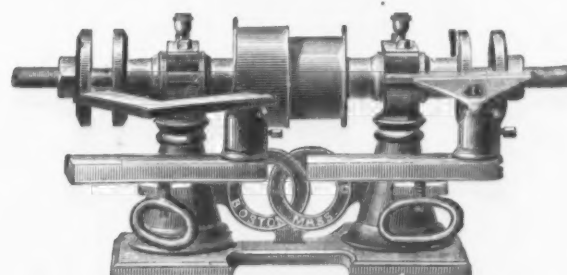
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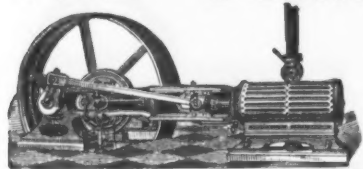
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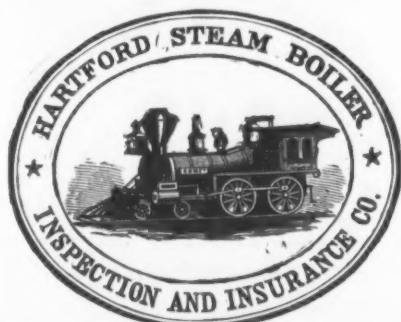


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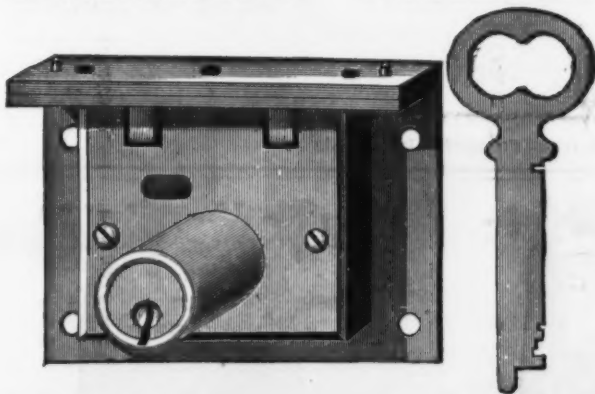
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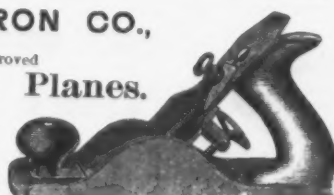
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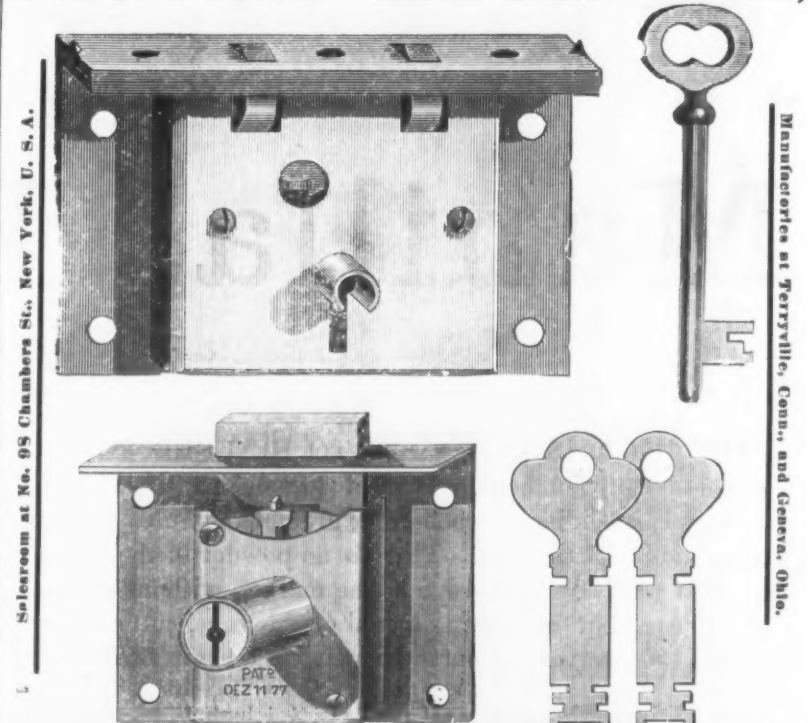
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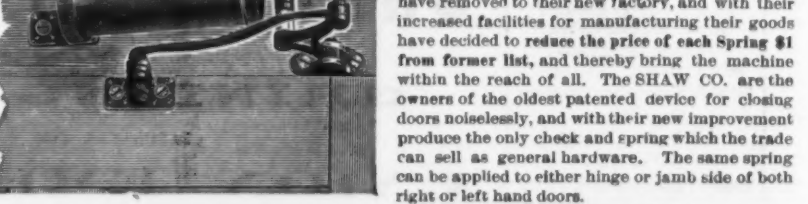
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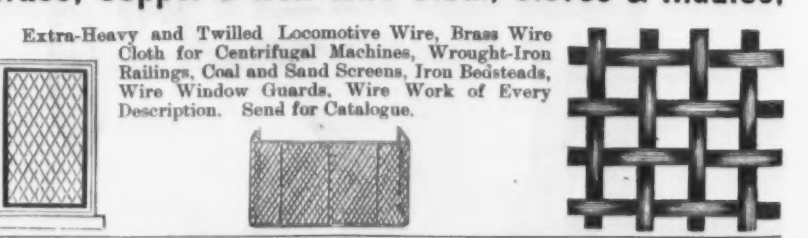
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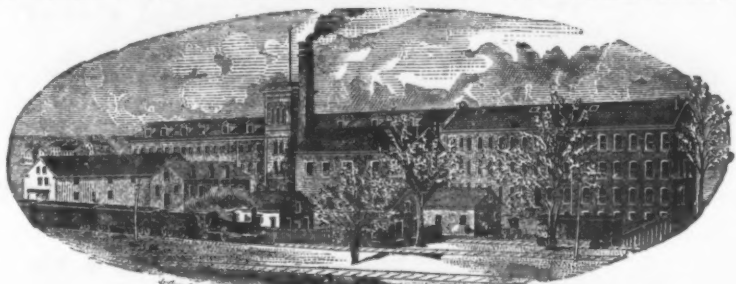
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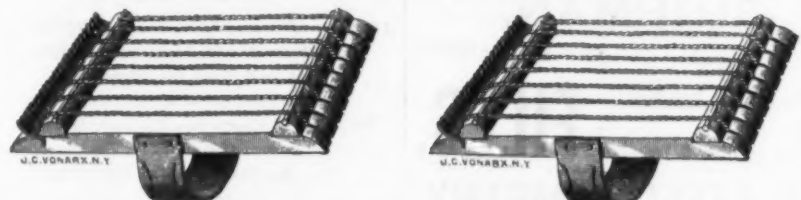
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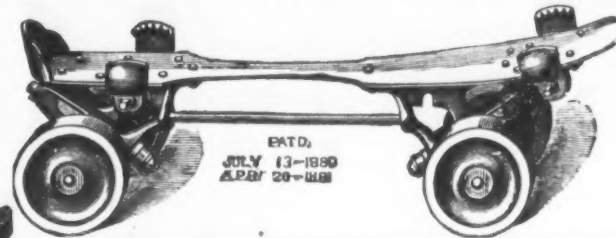
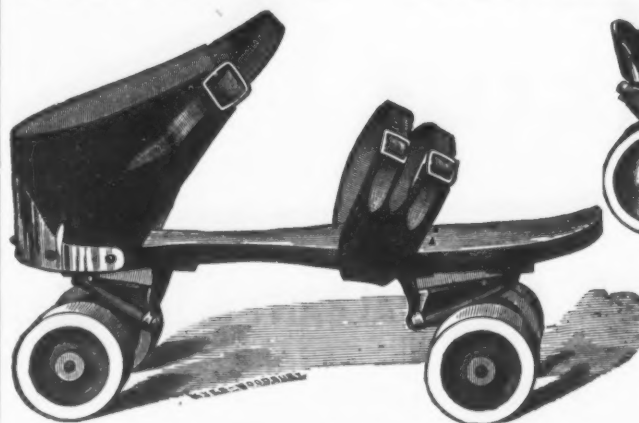


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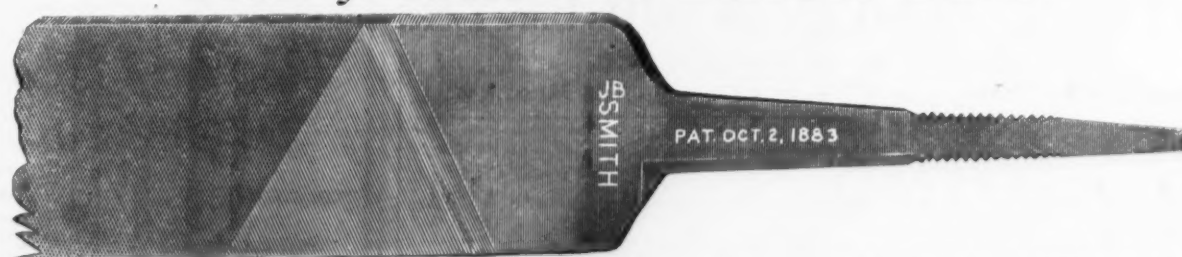
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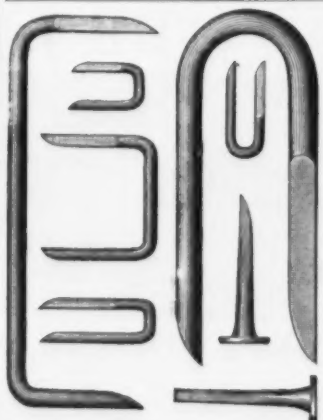
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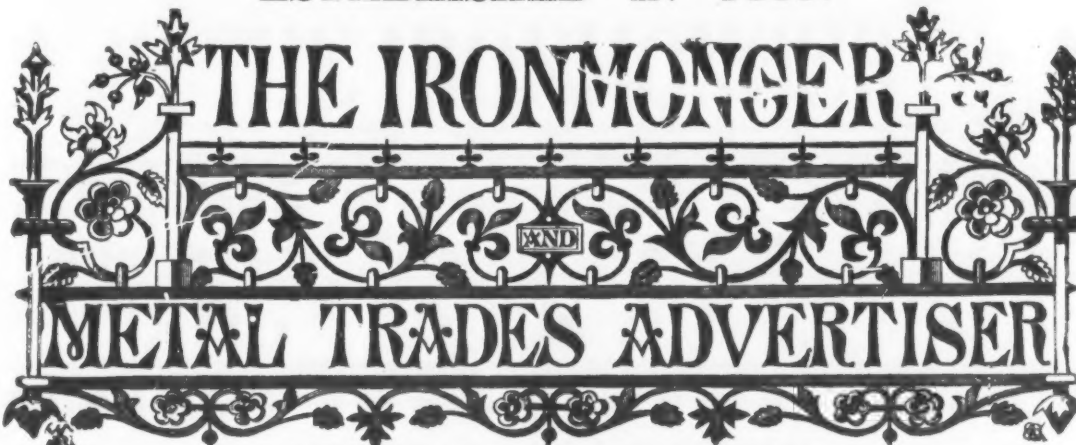
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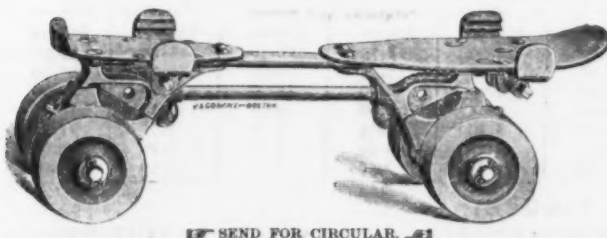




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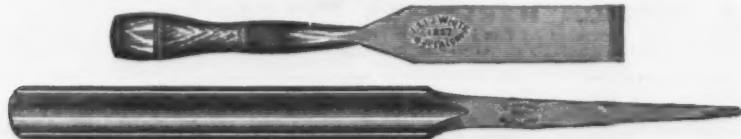
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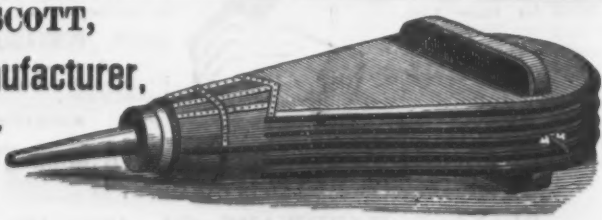
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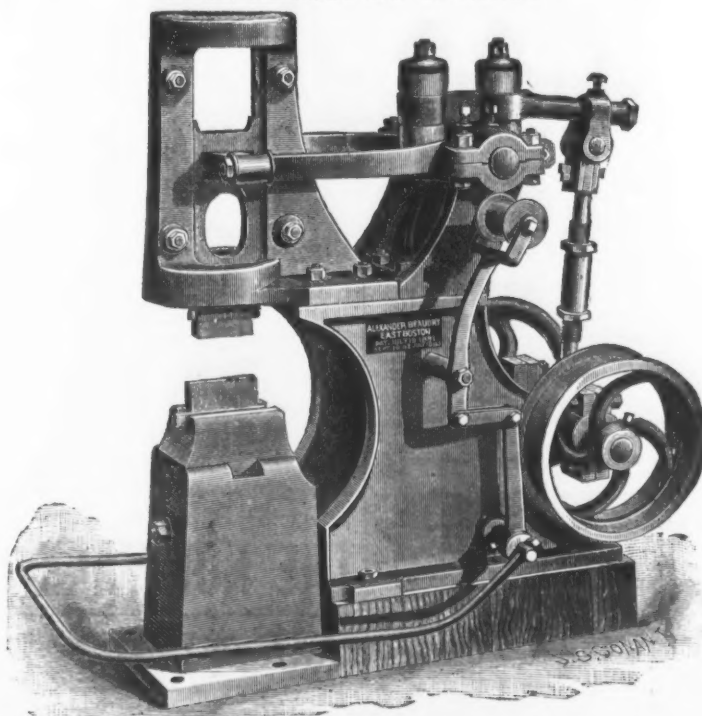
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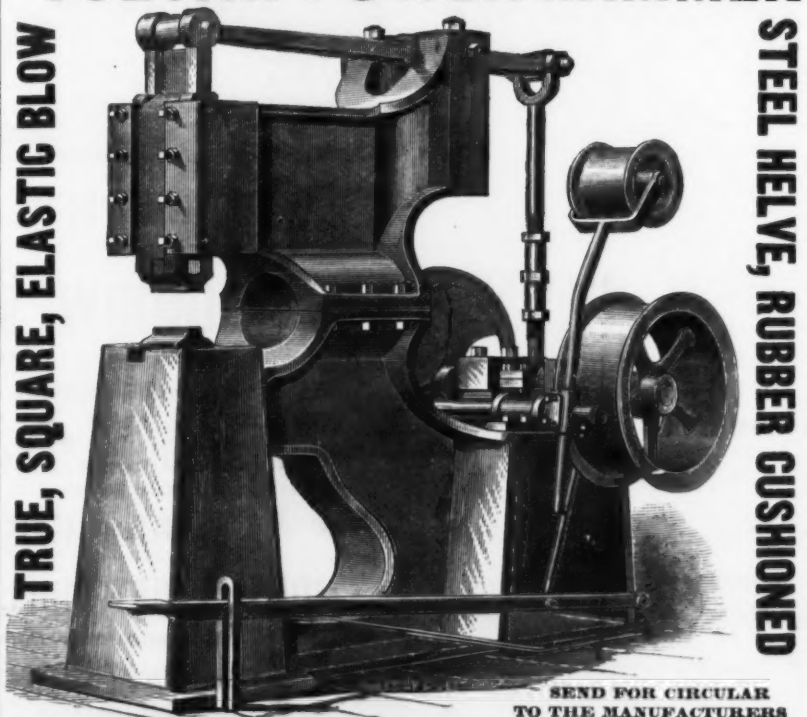
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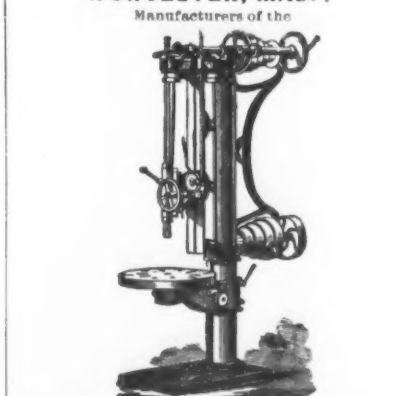
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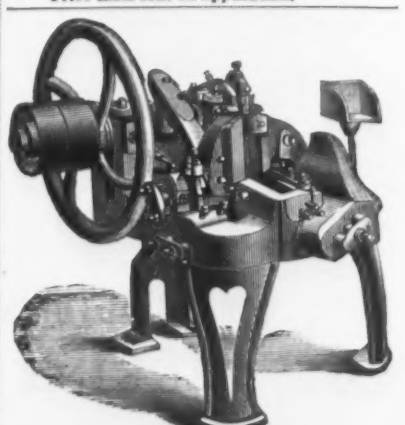
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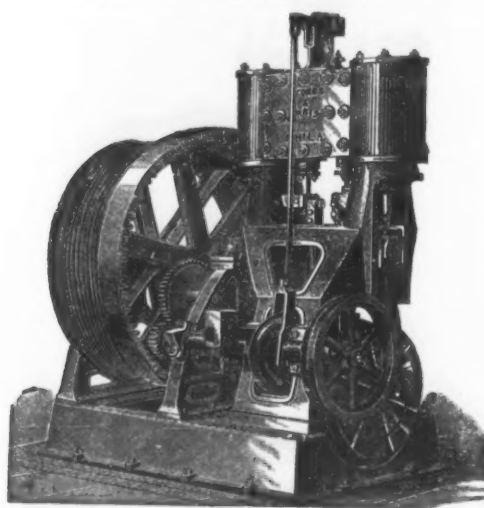
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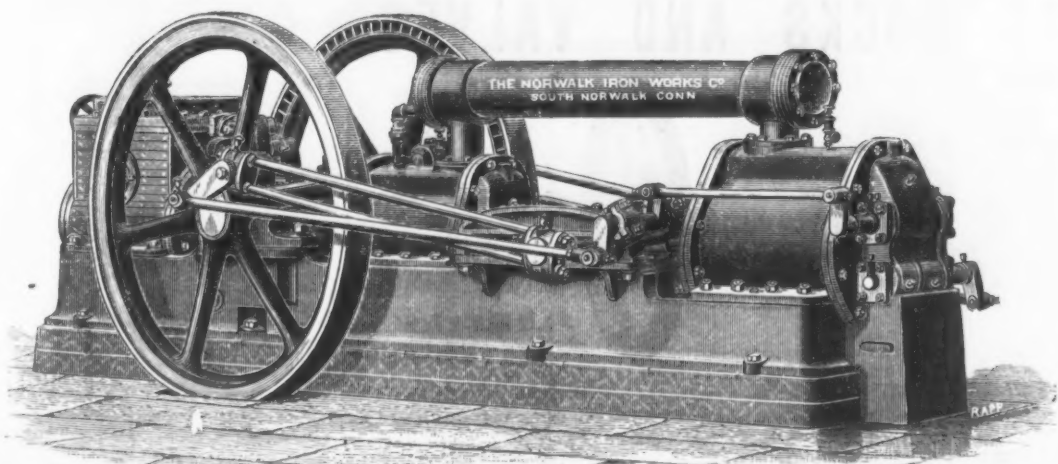
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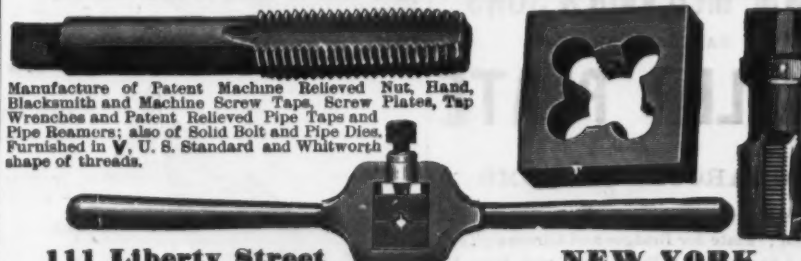
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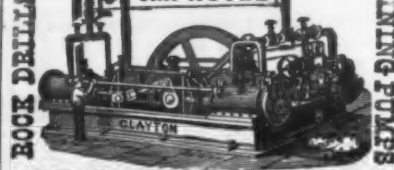
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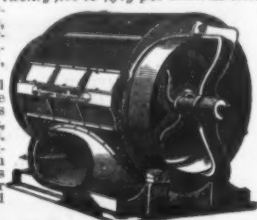
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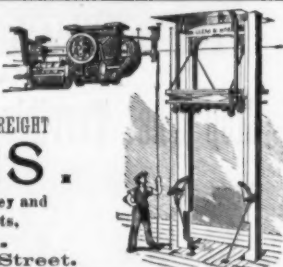
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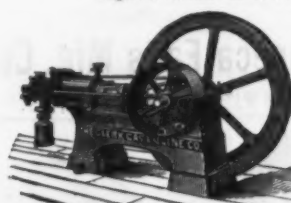
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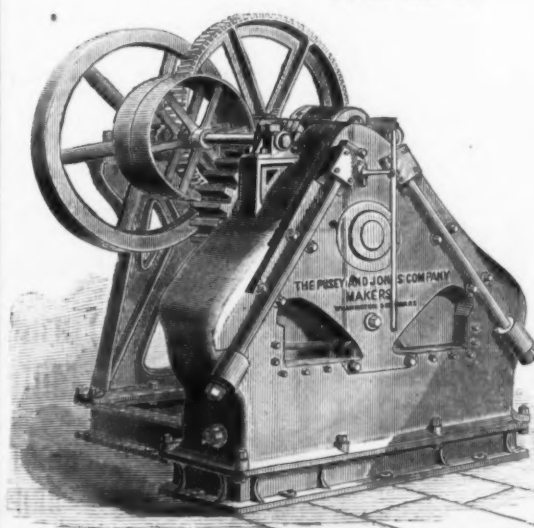
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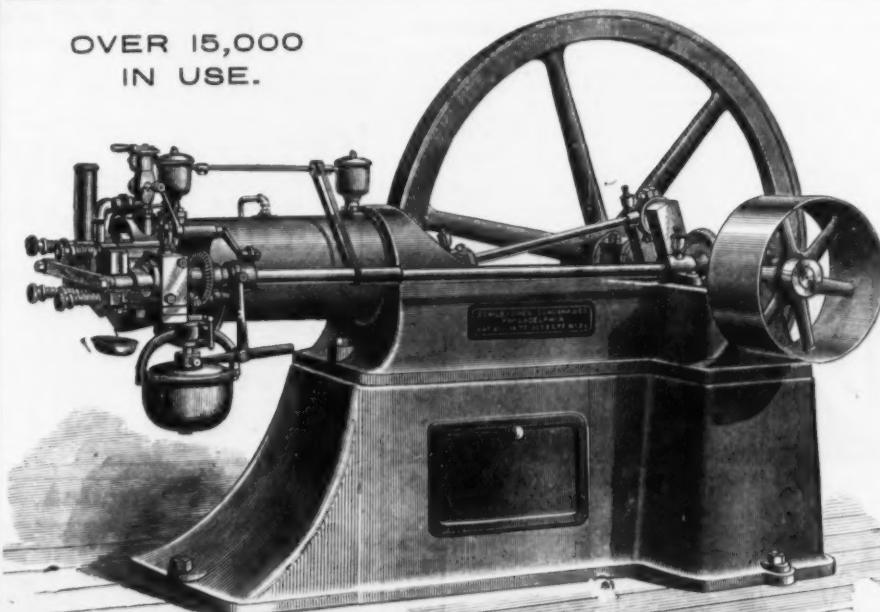
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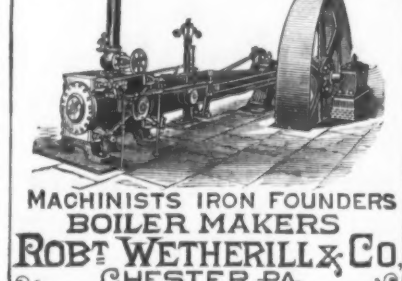
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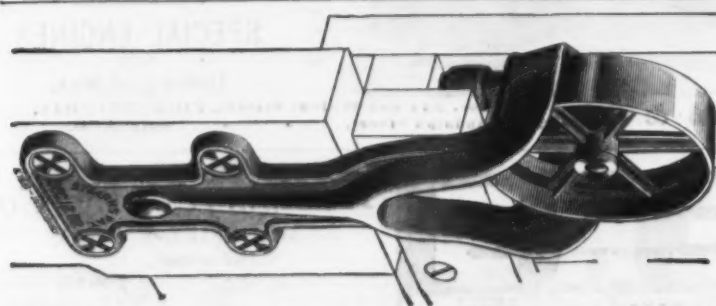
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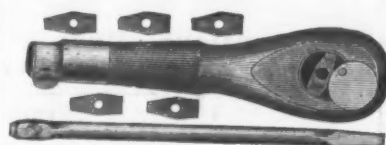
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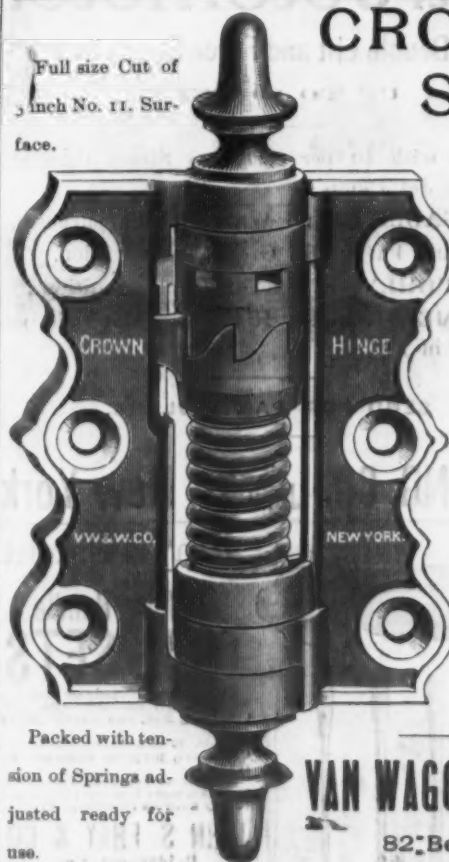
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